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vol22no1

Washington State

MAGAZINE



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It's no small
help for bees

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LEFT: THE DUCK POND GAME AT THE WASHINGTON STATE FAIR IN PUYALLUP (FROM VIDEO BY ROBERT HUBNER)



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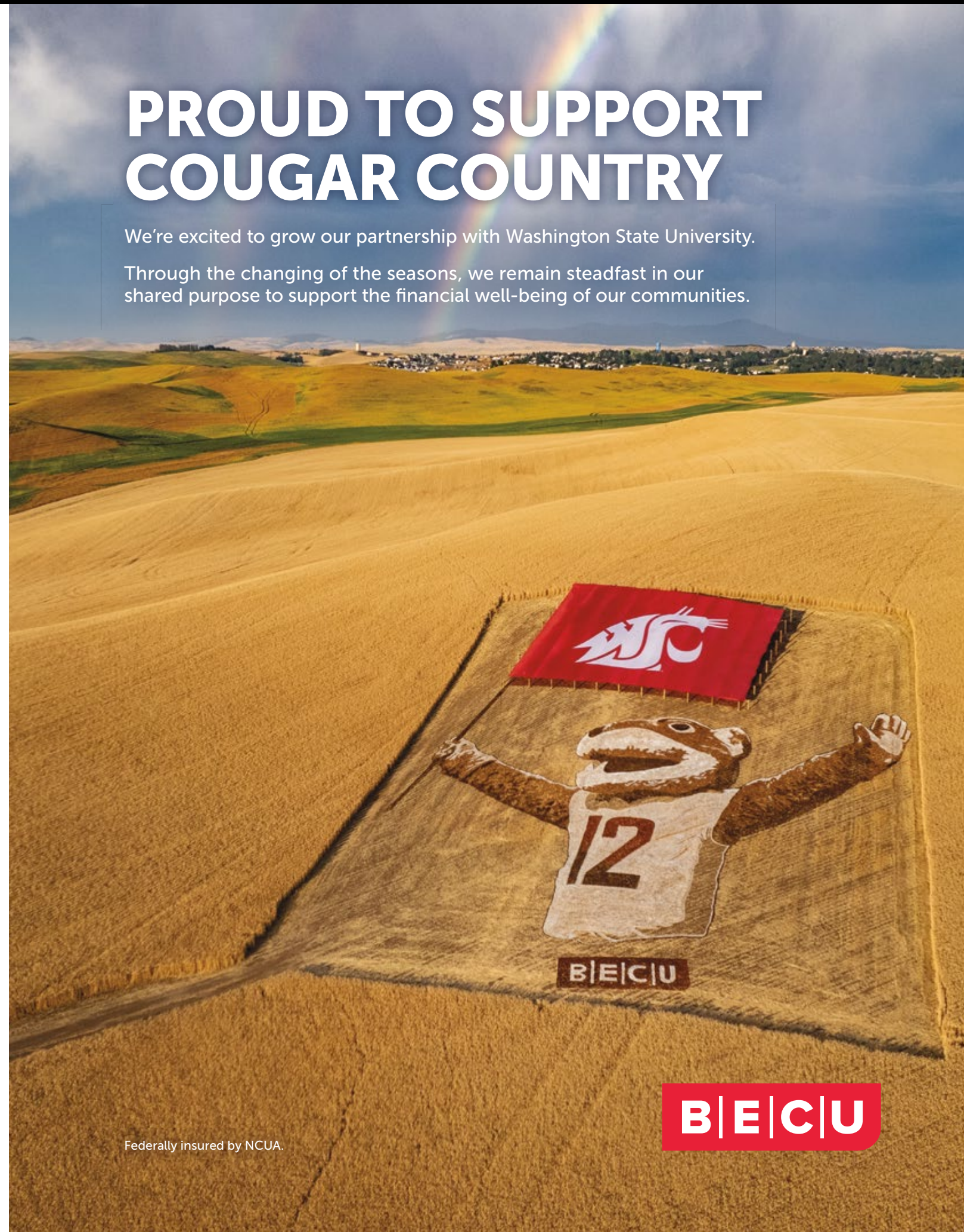
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FIRSTwords

In praise of simple things. In a world that's beset with huge changes, it is sometimes hard to appreciate small things.

Consider the mouse-ear cress, *Arabidopsis thaliana*, which grows by roads and sidewalks. Not much to see, the little weed has a very small genome and in 2000 was the first plant to be completely sequenced. Its very simplicity has made *Arabidopsis* a powerful research tool for plant scientists at Washington State University and around the world.

WSU scientists have used it to identify a gene that allows the elimination of trans fats from many cooking oils and fats, find ways to help plants adapt to climate change, and investigate many other areas of plant research that make a big difference in Pacific Northwest agriculture.

Another often overlooked group of organisms, fungi, also seems deceptively simple. Yet different types of fungus could help save honeybees from parasites, assist crops in taking up nutrients from soil, and can provide a model to break down plant waste for biofuels. Plus, the thready rootlike structures of fungi, mycelium, can grow robustly into almost any shape and be hardened for a biodegradable material. One WSU student even made a canoe of the stuff.

Sometimes, though, the smallest things feel so hard. Feeding your child, particularly if the child has Down syndrome, can turn into a difficult activity. WSU food scientist Carolyn Ross faced that situation, and it led her to research food textures. Her findings might give relief to many parents who struggle with feeding their children.

Simple pleasures also enhance our lives. For some, that means shopping and the dopamine rush of a serendipitous find at places like WSU's surplus store. Check out that wonderland of oddities and treasures in this issue.

As the pandemic gradually decreases, we begin to enjoy events again, such as the thrills of a fair. WSU and its connections to agriculture have long been entwined with fairs, and all their nostalgic, fun, and even futuristic features.

We can receive such wonderful, uncomplicated joy from fair food, rides, entertainment, or the smile on a 4-H kid who just showed a prize goat. As Bilbo Baggins says in J. R. R. Tolkien's famous novel, "It is no bad thing to celebrate a simple life."

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TALKback

Happy times

The Fall 2022 issue shared happy memories of WSU from alumni, faculty, and staff. We asked for readers to send in their own recollections, and here are a few that we received.

Saturdays in the fall: leaving my room at the Kappa Sigma house that 30 years earlier was shared by my father and his roommate, Edward R. Murrow, and walking to Rogers Stadium where I did the football PA announcing, while in the next booth sat Keith Jackson doing the play-by-play broadcast on KWSC.

MACK PARKHILL ('56 BUSI.)
OHIO

Pretty much everything at WSU made me happy! My view of the mountains from my dorm room, communication classes with Glenn Johnson, buying supplies at The Bookie, and heated sidewalks! Then weekends in Martin Stadium and dinners at Sella's. I didn't even mind my harder classes

too much; I was so content to be on campus. I am so glad that I was a student there, and so happy to be a Cougar!

ANDRINA (ARNESON) THOMAS ('91 COMM.)
KENT

Some of my best years and memories of my life were at WSU from 1979 to 1983. I absolutely loved it there. I was at Regents Hall 313, and that was my little sanctuary. I made friends there that have lasted a lifetime! My favorite place to study was at the CUB.

I was at WSU when Mount Saint Helens blew. I remember that May Sunday very well on campus. It was raining ash and we all wore masks. I loved walking around campus every season. The stillness, the scenery, such a magical place that I did not want to leave because I loved it so much there. Go Cougs!

SALLY SUE BATE ('83 SOCIO.)
KIRKLAND

Absolutely everything. It was my first time away from home and my first time in the beautiful state of Washington. So many new experiences, my senses were on overload. The football games, watching the snow fall, hearing the bell toll, my friends and colleagues, my dorm (Stevens Hall), my classes and teachers, and eating with friends at the dining hall. It all suited me perfectly. I am now 70 years old, and I still remember my time there as the best six years of my life. I am forever grateful that I chose WSU, and WSU chose me back.

JAE LUCIDO-MARTIN ('76 PSYCH.)
IOWA

Correction

The review of *Cadenzas*: A work of fiction in the Fall 2022 issue listed the wrong publisher. The correct publisher of Alex Kuo's novel is *redbat books*.

ORIGINAL PHOTOS AVAILABLE VIA WSU MANUSCRIPTS, ARCHIVES, AND SPECIAL COLLECTIONS



THE SUBZERO TEMPERATURES AND SNOW at an infamous football game in November 1955 didn't make anyone happy. The Cougs played San Jose State to a 13-13 tie, but only after plows removed snow from the field. "The band left prior to halftime as the lips of the horn players were freezing to their mouthpieces," says Mack Parkhill '56, who was the game's announcer. Many of the San Jose State players had never seen snow, and "their coach bought every pair of cotton gloves in Pullman," Parkhill recalls. "The players on the field were trying to avoid frostbite on each down. They absolutely earned their scholarships that day."

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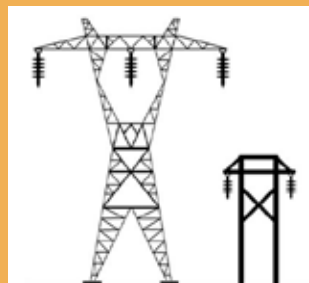
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Fundraising continues for the state-of-the-art Schweitzer Engineering Hall on WSU's Pullman campus. When complete, the facility will be a central hub for WSU engineering and design students to innovate, collaborate with faculty and each other, and access advising, technology, and other activities that are foundational to their success in college and beyond.

This is the first phase of an ambitious, multiyear vision to modernize the college's teaching and laboratory spaces for the 21st century.



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— Sara Minogue | MECHANICAL ENGINEERING

UPfront

Power to the people—and to the planet

BY TINA HILDING

A small town in Alaska hooks up solar power and a backup generator to keep the lights on.

Two villages in India use cow manure and solar energy to get electricity in their homes for the first time.

In Spokane, researchers study how to share solar energy back and forth across power lines throughout the Pacific Northwest.

Meanwhile, a clock is ticking. The threat of climate change hangs in the air like smoke from increasingly common wildfires or like the hot summer days that now linger too long into the fall.

“The million-dollar question is not how to add more wind and solar to the power grid,” says Anjan Bose, Regents Professor in Washington State University’s School of Electrical Engineering and Computer Science. “It’s how to make it run reliably and at the same time, try to bring up the resiliency, given the kinds of issues we’re facing with extreme weather and cybersecurity threats.”

It’s a daunting challenge for the world to move quickly to renewables and prevent the worst impacts of climate change. The way we get energy is changing rapidly and dramatically, and the road to decarbonization runs straight through eastern Washington.

“Eastern Washington is really a ‘power’ power,” says Noel Schulz, Edmund O. Schweitzer III Chair in Power Apparatus and Systems and codirector of the WSU and Pacific Northwest National Laboratory (PNNL) Advanced Grid Institute. “As you look at PNNL, WSU, Avista, Schweitzer Engineering Labs, and Itron, we really have a lot of innovation coming out and working on solutions on the next grid.”

Sectors such as transportation and power generation will need to decarbonize, which means moving to sustainable energy such as hydropower, wind, solar, and perhaps tidal energy later. Nuclear energy also doesn’t emit greenhouse gases.

“The common thread between all of these energy sources is the power grid,” says Mani Venkatasubramanian, Boeing Distinguished Professor in the School of Electrical Engineering and Computer Science and director of WSU’s Energy Systems Innovation Center (ESIC). He also holds a joint PNNL appointment. “The key is how can we support the entirety of energy consumption by harnessing it to the power grid. The biggest engineering challenge is to do this without sacrificing the reliability and affordability that the customers are used to.”

Unlike a coal-fired power plant, sustainable energy is largely distributed—such as solar panels on rooftop after rooftop. Solar and wind power also famously work when the sun is shining and the



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SEL SCHWEITZER ENGINEERING LABORATORIES

wind is blowing. They can't be easily stored. Meanwhile, as power grid operators have to change the way they've always done business, climate change and serious events like extreme heat, flooding, and wildfires are creating more demand and causing more interruptions for the grid. Utilities now have engineers on staff to specifically plan for extreme events.

"As we are going through the transition, we have to, in fact, improve our system," says Venkatasubramanian.

Looking at the power grid's "edge," like small solar panels on a home, may provide new opportunities for energy storage, says Anamika Dubey, Huie-Rogers Endowed Chair in the School of Electrical Engineering and Computer Science. Dubey, who holds a joint appointment with PNNL, and her colleagues have been looking into how to leverage assets at the distribution level, such as rooftop solar panels or electric car batteries, as storage to improve flexibility.

"One of the main challenges is that when we get to the grid edge, the scale of the problem is too large—we're actually looking into tens of millions of devices," she says. "If you're

trying to aggregate them and provide their flexibility or support for the bulk grid, how do we develop models that are helpful enough for us to inform the decision-making process?"

Microgrids are also an increasingly popular possible solution for energy challenges. Microgrids are self-contained grids with a local energy source that can be connected to the larger grid but can also function independently. Through a partnership with India, WSU researchers are working with two villages there to develop and test microgrids.

"Renewables are a challenge, but they can also provide an opportunity in rural electrification—places where there are no power lines and transmission, where we can use local resources," says Schulz.

While the researchers look toward making better use of the renewables, they're also keeping an eye on better managing the traditional bulk power grid. Venkatasubramanian's group, for instance, has developed a software tool to monitor oscillations and the health of the power grid in real time that can notify grid operators when instability is occurring. The software tool was recently licensed by France's

grid operator and helped to quickly and seamlessly transition Ukraine from Russia to the European power grid last winter.

"The technology is helping with such uncertainties, and that's the kind of technology that we need a lot more of in the future," he says. "As we have these renewables more and more in the system, we need to be able to operate on the go."

The solutions are available now; perhaps they are not the most elegant, but they can be done, says Bose.

"The question is not really about technology. It's a question of actual deployment and whether we can deploy within the time frame that has been laid out. That's the real question, and that's not dependent on either universities or even the federal government," he says.

So how confident are the researchers that society can incorporate renewables into the power grid to prevent the worst effects of climate change?

"One hundred percent," says Venkatasubramanian. "Because that's what engineers do. When we have challenges, we find solutions." ❄️

JORDAN SCHNITZER MUSEUM OF ART WASHINGTON STATE UNIVERSITY

JUVENTINO ARNADA: ESPERÉ MUCHO TIEMPO PA VER

August 23, 2022 – March 11, 2023

In Juventino Aranda: Esperé Mucho Tiempo Pa Ver (I Have Waited a Long Time to See), the artist searches for identity as a “Mexican and second generation ‘American,’” among social, political, and economic struggles and notions of the American dream.

left: Y Llegaron Las Flores (The Funeral) detail

JORDAN SCHNITZER MUSEUM OF ART PORTLAND STATE UNIVERSITY

THE ART OF FOOD

From the Collections of Jordan D. Schnitzer and His Family Foundation

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Positive Fragmentation

Eskenazi Museum of Art at IU • Bloomington, IN • 7/14/22 – 12/11/22

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Fisher Museum of Art USC • Los Angeles, CA • 9/6/22 – 12/3/22

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UPfront

More than a matter of taste

BY REBECCA PHILLIPS

Watching your baby struggle to eat can be heartbreaking. The daily challenge of offering food only to have it rejected by an unhappy crying child leaves parents frustrated and frightened, all the more so when their child has Down syndrome.

Carolyn Ross, professor in the Washington State University School of Food Science, knows the difficulty firsthand.

“In the beginning, my son Isaac got very annoyed while eating and expressed that with his behavior,” she says. “As the gatekeepers of our child's eating experience, it can be very stressful trying to figure everything out.”

Ross, who specializes in the chemical and physical analysis of food, had no training in child feeding but could see that her son with Down syndrome was handling food differently than his two older sisters had.

“If a child's unhappy, we immediately tend to think it's taste or flavor, but there's also the sensory input feeling of it and how it feels on the lips or in their hands,” she says. “There are a lot of things that go into the eating experience, including a comfortable high chair.”

Wading through online anecdotal information and scientific literature in 2012, Ross learned that children with Down syndrome have a smaller and narrower jaw, smaller mouth cavity, and more dental problems than typically developing children.

“At that time, however, there was very little information about how their anatomy influences what they eat and how can we use that information to start them on their texture journey,” Ross says. “It's not like you go from eating applesauce to steak the next day. It's a food texture journey and you kind of move along as you get used to different textures.”

Desperate to help her son as well as other parents and pediatricians, Ross launched her own study, which was published last June in the *Journal of Texture Studies*. The investigation is the largest of its kind for children with Down syndrome.

adhesive, chewy, cold/warm, creamy, crispy/crunchy, dissolvable, doughy, dry, firm, gritty/grainy, gummy/rubbery, hard, **[TEXTURES]** juicy, lumpy, mealy, mushy, pasty, puree, gooey/soggy, smooth, soft, spongy, stringy/tough, tender, thick, thin

Through a nationwide search, she enrolled 218 children, including 111 with Down syndrome, for a home-use test that evaluated the appeal of various-textured snack products. The study included a contingent of typically developing children as the control group.

“Participants each received a gigantic box of food,” says Ross. “We included four food products, and each product was fed once a day for six days. We also sorted the products by flavor categories, like cheesy, and assigned each child flavors they liked.”

“Caregivers filmed the child's reactions as they tried the foods,” she says. “Later, my colleagues and I analyzed the videos and coded them for the various behaviors.”

The results revealed that some children, whether typically developing or with Down syndrome, are texture sensitive and others

are not. That sensitivity plays a major role in the child's eating habits.

Children with Down syndrome and texture sensitivity showed a clear preference for dissolvable snacks like puffs or vegetable straws. They also liked oily and crispy textures but tended to reject snacks that were dense, gummy, or hard. These children ate significantly less than all the other children.

In addition, youth with Down syndrome often have oral sensory processing difficulties that make them over- or under-sensitive to the food in their mouths. This can lead to overstuffing the mouth and problems with

gagging and choking. Choking is a frequent cause of death for these children.

“I think the takeaway for parents is to view texture acceptance as a journey,” Ross says. “Start with a preferred texture like pureed applesauce and move into less preferred textures over time such as denseness and gumminess. And really be patient with feeding. Allow the child to interact with the food.”

Ross says the study helped her family understand that Isaac is hypo-responsive—he has low registration of sensory input to textures.

“That explained a lot of his behaviors,” she says. “And we eventually were able to move him forward with textures. He really liked dissolvable foods, so we looked for something dissolvable that was more nutritious and with higher fiber to help move him along.”

Ross is currently working on another paper that incorporates the texture and flavor information as well as shape, color, and size to create a complete dietary picture.

“It's essentially designing food for a child with Down syndrome,” she says. “The idea is to get information and food products out there to help move children through the texture journey.”

“Ultimately, we want to provide texture so children can learn how to process it and know what to do with food in their mouth,” Ross says. “We want to decrease the risk of choking as they get older. And to give them more nutritious foods as well as quality of life with more variety.” ✨



Carolyn Ross offers her son samples in the food science laboratory. Photo courtesy Carolyn Ross

MORE EXHIBITIONS FROM
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Waiting to exhale

BY REBECCA PHILLIPS

Adolescence can be a rocky road for any child, but for those whose family members have made the ultimate military sacrifice, the challenges are even more complicated.

Whether that's a Wounded Warrior father struggling with PTSD or a Gold Star Family whose mother was lost in combat, these teens must navigate a world that is foreign to most of their peers.

Hoping to provide the children a bit of respite and support, Gary Varrella, Washington State University Spokane County Extension director and 4-H educator, worked with Karen Hammock, Spokane 4-H military liaison, to establish Camp Rendezvous in 2021.

"We had never done a camp like this in Washington before," says Varrella. "This was designed specifically for this unique population that likely has high levels of adverse childhood experiences, or ACEs. There may have been some Wounded Warrior and Gold Star kids in other military camps but never a camp just for them."

Spokane County Extension 4-H has served Washington's military youth for more than 15 years through a variety of residential camp experiences, says Hammock. Their office has ongoing partnerships with the US Army, Air Force, and National Guard. At one time, they even worked with the Navy.

Through grant funding and donations, Varrella and Hammock were able to hold Military Youth Camp Rendezvous again last August at the Sound View Camp and Retreat Center near Longbranch, Washington. It was open to teens aged 13–17.

"We only take 25 campers because these youth come with many more struggles," Varrella says. "We rent the entire campground for five days and the world revolves completely around them. There are no other campers or distractions, and by the third day, they're beginning to talk candidly and share their concerns and traumas, which are many and complex."



PHOTO HANNAH GOODMAN

To that end, Hammock says the military provides two full-time military and family life counselors free of charge. Camp staff also includes an art therapist and theater therapist, as well as retired military members, and two medics, both ex-military. All have been background checked and trained.

WSU Extension 4-H faculty members Ashley Hernandez-Hall from Snohomish County, Brian Brandt from Pierce County, and Alison White from Kittitas/Yakima Counties also offer special sessions meant to help the teens develop resiliency and establish a sense of belonging and rapport with other campers. Michelle Green of King County Extension 4-H adds some fun through STEM workshops.

Their combined efforts have been truly inspiring according to parents.

My daughter chose this camp specifically because it would allow her to be around other military kids who have experiences similar to her own—kids whose parent had suffered injuries in combat. She found a level

of peers that she hasn't found elsewhere. It allowed her to open up a lot more and share things that she hasn't shared with other friends back at school.

My son ... is a child of a disabled veteran. He didn't get the opportunity to know his dad prior to his traumatic brain injury. He was able to come home from camp and share his experiences with us, and it gave him a platform to ask questions to his dad with a little more understanding and grace after hearing from other campers about their shared experiences.

These military youth face so much in their lives, many struggling with a loss of a family member or long-term hardships from their family's military service. This camp gave these campers more than any other I've ever seen, providing resources, teaching tactics to help with stress, and opening a safe place to share their burdens. I hope

Camp Rendezvous continues to be that place you belong!

Varrella has worked with youth for 50 years but says Camp Rendezvous was the most "profound, meaningful, impactful camp for teens" that he's ever been involved with during his career.

"It blew me away," he says. "Not just the challenges these teens faced and managed but the candor and sincerity that came out of us building a trusting safe environment for them to be able to have a vacation from that difficult life, and to be able to share things that they hadn't been able to share before to parents, siblings, therapists, or even out loud to themselves.

"I think Karen and I are probably more proud of the work we've done with these camps than any of the others in the last 15 years." ✨

WSU EXTENSION OFFICES provide youth development programs and volunteer training to military bases throughout Washington state. At Snohomish County Extension, 4-H assistant professor Ashley Hernandez-Hall runs the WSU-GPI Military Teen Adventure Camp in partnership with Glacier Peak Institute.

The camp, which began in 2021, offers military teens aged 13–18 a Pacific Northwest experience filled with hiking, kayaking, mountain biking, archery, outdoor survival skills, and the chance to create lifelong friendships.

"The camps are new to my program, but WSU 4-H has hosted them in the past," Hernandez-Hall says. "They are funded by competitive grants from the US Department of Defense, which are managed by Purdue University. This year, there were six US camps held in Arizona, Colorado, Georgia, Hawaii, Kentucky, and Washington.

"I think what's unique about ours is we do everything we can to make sure the camps are as close to free as possible," she says. "We go to considerable effort to provide funding to each family so their youth can get here. Our campers fly in from all over the nation."

Making a world of difference

BY ALYSEN BOSTON

Whether Cougs are serving aboard an aircraft carrier, exploring the jungles of Sumatra, or living a couple thousand miles away in Toledo, Ohio, the Global Campus offers the same faculty and high-quality learning available at Washington State University's brick-and-mortar campuses, built on three decades of experience.

degree program 30 years ago, but its mission remains the same.

"Our DNA hasn't changed. It's all about connecting students to faculty to curriculum to one another," Cillay says. "We're a land-grant institution, and this program is all about providing access to higher education to the citizens of Washington and beyond."

And in that endeavor, Global is succeeding. In the spring of 2022, Global Cougs came from 49 states and 48 different countries.

Cillay, who joined Global's staff in 2003 and later was selected as the campus's first chancellor in 2019, says the shift to online learning during the pandemic brought Global's existing strength to the forefront.

"All the tools have been here for a while," Cillay says. "We've been doing online learning for decades. The change is in the perception. And as the maturity of online learning be-



Andrea Mora-Tice lived in three countries while finishing her WSU degree. Courtesy WSU Global Campus

Andrea Mora-Tice ('21 Anthro.) visited nearly 30 countries and lived on two different continents during her studies at Global.

"My husband just got a job in Indonesia and we had an 18-month-old daughter when I enrolled. The fact that WSU let me study online and live outside the country was amazing," Mora-Tice says. "I never thought I would be a college graduate, but I could do my work when my daughter was asleep at night."

Chancellor Dave Cillay says Global has come a long way since it began as a distance

comes more accepted, we're really going to diversify our student audience."

Enrollment numbers have continued to grow since the pandemic began, Cillay says, and while the average student at Global is a working professional in their 30s, Global has seen students in their 60s and as young as 16 enroll.

"It's a great time for WSU," Cillay says. "We've got some really interesting opportunities in front of us through our Global Campus. I see Global continuing to improve over the coming years." ✨

A surplus of surprises

BY ADRIANA JANOVICH

Coffee tables and couches from executive offices. Filing cabinets. Lockers. Desks. Refrigerators—some working,



some not. Assorted tables. And. Oh. So. Many. Chairs. Most of them office variety, some of them swivel, for as little as a dollar. Plates and wineglasses from catering services or special events.

“We’ve had folks who are starting restaurants come in and load up,” says Keith Davison (x’04). “You could stock your apartment. There’s a lot of stuff—a little bit of everything.”

It’s true that serious shoppers—Washington State University college students, perhaps—could practically furnish entire apartments from the wares at the wonderland that is WSU Surplus Stores. At the very least, alumni could own a piece—or many pieces, new and used—of WSU history.

Upright pianos. Exercise equipment, from elliptical machines to punching bags. New coffee mugs promoting Cougar basketball. Also new: crimson T-shirts from the 2017 Holiday Bowl and football cleats, size 17, in their original box. Roller skates, which



big cardboard box full of rubber boots likely left over from the WSU Creamery—a steal at \$10 per pair.

Items highlighted on Instagram and Facebook tend to sell fast. In fact, there’s no online store because, Davison says, “inventory changes so quickly.”

There are, however, online as well as in-person auctions, where patrons can often find larger and more unusual WSU items such as a 1960s metal milling machine, hurdles from WSU track and field, rolls of artificial turf, and relics from soon-to-be-demolished Johnson Hall.

“It’s a weird mix of lab and farm equipment, office furniture, athletic gear, and stuff

that is WSU-owned, with the exception of real estate, comes to us.”

WSU Surplus Stores is charged with proper handling and disposal of university property. State law governs the process. Hazardous chemicals or waste aren’t accepted.

“We work with departments to make sure everything is handled at fair market value so taxpayers aren’t getting short-changed,” Davison says. “If we can return some money



Opposite, and this page: Used keyboards, new T-shirts, holiday knickknacks, old yearbooks, football cleats, and metal filing cabinets are just a few of the items found at the wonderland that is WSU Surplus Stores. Photos Robert Hubner

back to the department—\$159,391 in the last fiscal year—we will do that. But we are a self-sustaining operation. Sales support our operations.”

The center also handles departmental storage and works closely with WSU Facilities Services Operations Waste Management and its recycling programs. “We minimize waste as much as we can,” Davison says. “It’s a continual process.”

During the first half of 2022, WSU Surplus Stores collected nearly 95 tons of

university-owned items. At \$137 per ton, it would cost about \$13,000 to dispose of those things at the local landfill.

Monday through Thursday is for pick-up, sorting, and pricing. Those days are also reserved for shopping by WSU departments and state agencies as well as municipalities, school districts, and nonprofits. On Friday, the warehouse at 250 Dairy Road in Pullman opens to the public. “We see a lot of the same faces every week,” says Davison, noting WSU Surplus Stores sold 18,575 items during the last fiscal year. “There are



One of the strangest things former material resources manager Wayne Gash ever sold at a WSU Surplus Stores auction was a three-legged calf, he told *WSU Week* in 1999. Another unusual sell: a bottomless wooden boat. (The buyer turned it into a sandbox.)

Reusing and recycling are the heart of the operation, which traces its roots to 1946. That’s when Charles Byron “CB” Jones came to Pullman to manage Central Stores and Surplus Property. He spent most of his time acquiring US Army surplus, repurposing equipment, and becoming known as Mr. Fix-It. Jones managed the department until

quite a few regulars who get here right when we open at 10 a.m.”

John and Cathy Burris of Troy, Idaho, are frequent shoppers. Among the items they’ve purchased are filing cabinets to store his tools and her sewing patterns. “I can’t remember what we paid for them, but it was a good deal,” she says. “You just never know what you’re going to find,” he says.

1974. Sales were open to the public in the mid-1980s.

“There are people who have been coming here since before I was working here,” Davison says. “That’s a fun part of the job, meeting not only people we work with on campus but customers who come to the store.” *

Oh, Christmas trees!

BY ADRIANA JANOVICH

DR. CHRISTMAS TREE is used to the question. He gets it all the time. What is the perfect Christmas tree?

Don't expect him to name one kind of conifer. The answer varies depending on who's buying. He usually answers the question with a question. How long do you want the tree to last?

Gary Chastagner leads the Christmas Tree Research program at the Washington State University Puyallup Research and Extension Center's Ornamental Plant Pathology program. Throughout his four decades of research, the plant pathologist has studied needle retention, cut-tree care, disease management, variety improvement, and more. The goal: longer-lasting and healthier Christmas trees.

His latest work focuses on finding high-quality varieties with excellent needle retention and resistance to *Phytophthora* root rot, a fungal disease that limits where highly desirable species can grow in the United States.

The Pacific Northwest produces about a third of the country's Christmas trees, including virtually all the noble fir. It has the potential to hold its needles and last for a long time post-harvest. But there's limited, if any, *Phytophthora* root rot resistance within populations of noble and Fraser fir, another long-lasting variety that retains its needles well.

"We have identified several species of conifers, such as Nordmann and Turkish fir from areas around the Black Sea, which appear to be resistant to the *Phytophthora* in the Pacific Northwest," says Chastagner, who—along with researchers nationwide—is finishing a 10-year study to determine regional adaptability of these species for use as Christmas trees in America. The work has taken him to

Turkey and the Republic of Georgia for seed cone collection.

Chastagner, who recently won a Lifetime Achievement Award from the National Christmas Tree Association, has been looking for alternative species since the late 1980s after arriving in Puyallup in 1978. He began working on Christmas trees the following year, examining Swiss needle cast on Douglas fir—which then made up some 90 percent of Christmas trees grown in the Pacific Northwest. Growers needed help managing the fungal disease, and the state legislature directed WSU to work on the problem.

"Within a couple of years, we had demonstrated that over 80 percent of the Douglas fir trees in Washington and Oregon were infected and that losses exceeded \$3 million per year even though the premature loss of needles caused by this disease at the time of harvest only affected the marketability of a relatively small number of the infected trees," Chastagner says.

His lab showed the presence of infection on trees whose marketability was not affected had a hidden impact; they dried faster and shed more needles when they were displayed post-harvest. His lab also showed that a single annual application of fungicide to new growth two or three years before harvest, costing five cents per tree, controlled Swiss needle cast.

"The treatment program we developed is still widely used today, not just here in the Pacific Northwest but elsewhere. Growers have basically been able to eliminate losses caused by this disease for almost 40 years now."

That research led to his next project: studying how much moisture trees could lose between harvest and sale without being damaged. Identifying this threshold, coupled with studies on changes in moisture of trees throughout the supply chain, showed most drying occurred on retail lots.

Chastagner's research took him throughout the United States for retail lot surveys. He conducted his first surveys in 1982, when most retailers displayed trees on wooden stands. "Utilizing information from our retail

lot trials, now many retailers display trees in water and use overhead misting at night," says Chastagner.

Three-foot Christmas trees are part of his checked baggage. He gives his grandchildren their own annual Christmas trees. "Each kid gets to decorate their own tree," he says. "If my wife and I can't visit, I put them in a tube and mail them. They get their trees one way or the other. But it's more fun when we go and take them."

Chastagner and his team maintain about 12 acres of Christmas trees. Their research has been supported by the Pacific Northwest Christmas Tree Association, the Real Christmas Tree Board, Washington State Department of Agriculture, US Department of Agriculture, and industry partners.

"Gary Chastagner has been the most influential person in my development as a Christmas tree farmer," says Randy Rapetti, a choose-and-cut grower in Camino, California. He's allowed Chastagner to establish a Nordmann fir demonstration planting on his farm and written letters of support for research proposals. "I am a better farmer, and a better person, because I know him."

Kristi Scholz-O'Leary, president of the Pacific Northwest Christmas Tree Association, agrees. She and her parents, JoAnn ('68 Ed.) and Ken Scholz, who chairs the group's Advanced Research Fund, run Orting's Snowshoe Evergreen, a conifer nursery, choose-and-cut farm, and wholesaler that also houses one of Chastagner's test plots.

"His work stretches far beyond the Pacific Northwest," says Scholz-O'Leary, who chairs the association's capital campaign, which, along with the Washington Nursery and Landscape Association, is raising funds to establish an endowed chair for continued research after Chastagner's retirement. "We certainly would not be where we are today as an industry without Gary's work. He's not only a scientist and a researcher, but he is able to forge partnerships with other scientists and researchers. To me, he's more than Dr. Christmas Tree. He's a miracle worker."

If you want your tree to last 7 to 10 days, pretty much any evergreen will do. But if you want to put your tree up at Thanksgiving and have it last into the new year, you're going to want a noble or Fraser fir, or Nordmann or Turkish fir. "In some of our trials, we've been able to maintain some of these high-quality trees for two to three months," Chastagner says. "But it depends on how both the retailer and the consumer take care of the tree."

Wholesale growers tend to sell "very uniform" trees to retail lots. Choose-and-cut farms "cater to quirkiness or diversity or whatever it is a person is looking for. "Sometimes," says Chastagner, "the perfect trees are Charlie Brown trees." *



GARY CHASTAGNER
(PHOTO RANDY HARRIS/OFFSET)

YOU CAN DECORATE YOUR CHRISTMAS TREE ... AND EAT IT TOO!

Well, sort of. Nearly all conifer tips are edible. But they're best collected in spring, when tender, nearly neon-green needles stretch a half inch to an inch and a half.

These bright green tips are new spring growth at the ends of branches. Their citrusy, pine-like flavor is good in teas, syrups, scented sugars, sorbets and ice creams, and more.

Have you tried cooking with conifer tips?

Here are a few ideas to help get you started:

- Douglas Fir Shortbread Cookies
- Douglas Fir Fettuccine Alfredo
- DIY Douglas Fir Liqueur
- Douglas Fir Tip Sorbet
- Forest Friend Tea Recipe
- Spruce Tip Ice Cream

You can find recipes for these dishes and more at magazine.wsu.edu/extra/eat-fir



Strength in numbers

Above: WSU head football coach Jake Dickert. **Photo** Steph Chambers/Getty Images. **Opposite:** Dickert demonstrates team strength with a bundle of sticks. *Courtesy WSU Athletics*

BY JASON KRUMP

JAKE DICKERT POINTS TO A SPECIAL MEMENTO IN HIS OFFICE.

"I just got a new family picture ready to get hung up," Dickert says with a smile.

It is a photo of Dickert, his wife, Candice, and their three children, daughter Rylee and sons Jett and Jace, at the Cougar Pride statue.

Dickert then turns his attention to his office window.

Situated on the fifth floor of the Cougar Football Complex, Dickert enjoys an expansive view of campus.

"All the time," Dickert says when asked how often he looks at the scenery. "Best view of Pullman possible.

"I'll take recruits to that window," Dickert adds, explaining that he tells recruits, "This is the heart of Pullman right here, right where you're standing.

"I think it's a really cool visual that everybody gets when they come here."

Prioritizing family, whether at home or on the field, is what drives Dickert in his first full

season as the Washington State University head football coach.

"This is a place for family," Dickert says. "The best experience our players will have is because of each other. That's what can really unite a football team."

Uniting the team and setting the culture was at the forefront of his actions during fall camp in August.

"The biggest thing that we want to set out for is the connectiveness of the team," he explains.

To illustrate this, Dickert points to a group of sticks, nearly 100 of them, with a rubber band around it.

"These sticks right here represent connectiveness," Dickert explains, since they're impossible to break as a group.

Dickert takes one stick out of the collection.

"You pull a single one out, you can easily snap it," Dickert says, as he breaks a stick.

"How can we be connected?" Dickert asks. "When things go bad, they don't point fingers. They stay together. It's building a mindset for the hard times. One of my biggest jobs is to make sure when things are hard, we keep pushing."

Dickert knows there will be challenges ahead. Time is a precious commodity for him, especially early in the season.

"Sometimes it's hard that I spend more time with my players than I do with my kids in a season," Dickert admits, "and that's hard for me to say out loud."

Dickert says there are instances during the season when coaches will make excuses to spend more time in the office to prepare for gameday at the expense of family during the season.

"I've done that in the past," he concedes.

Staying consistent in a routine is how Dickert strikes a balance with work and family.

"There's a lot of people who say 'I can't make my daughter's volleyball game. I can't

be to this,'" Dickert says. "Well, you can. You just have to do it."

Dickert makes it a priority to carve out time with his family.

"We find little moments we can all share together," Dickert says. "Hopefully, someday, when Rylee or Jett or Jace look back on it, Dad was really present in those moments we got to share."

Dickert's coaching journey to Pullman has taken him and his family to North Dakota State, South Dakota, Southeast Missouri State, Augustana, Minnesota State–Mankato, South Dakota State, Wyoming, and finally to Washington State. All in the span of nine years.

"I don't think anyone realizes what coaches' families go through," Dickert says. "Everyone thinks your journey was perfect. It was anything but perfect. There were times when maybe we doubted if we can do this."

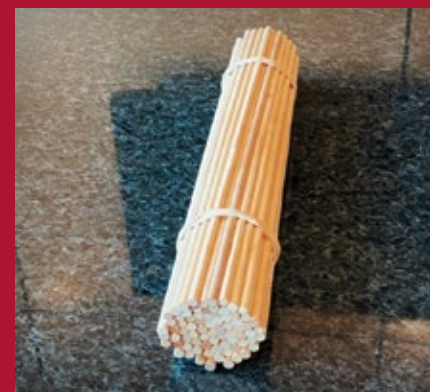
Dickert credits Candice for keeping him on track.

"She would always keep pushing me," he says. "Those are the support systems we all need in life."

On the eve of fall camp, Dickert posted the photo about to be displayed in his office to his Twitter account with the tweet: "Everyone needs to know their WHY!! Mine is real simple ... my family. I know that as we begin this journey with the team they are always right by my side."

"When things get hard, you always got to go back to why you do something," Dickert says. He points to his desk.

"When I am sitting over there and maybe things aren't going right, this is why I do it," Dickert says, as he points back to the picture. "Because I got a bunch of people at home who love me and support me." ✨



BY ADRIANA JANOVICH

Hometown health

BY THE TIME the Washington State University Elson S. Floyd College of Medicine welcomed its inaugural class in 2017, Pullman Regional Hospital had been exploring a medical residency program for nearly two years. The motivation was both practical and sentimental.

"We're located in WSU's hometown," says longtime hospital CEO Scott Adams. "That was a very compelling part of why we wanted to be affiliated."

WSU and Pullman Regional Hospital are long and inextricably linked. For nearly six decades, the community hospital was located on campus and housed student health services. Today, the two institutions partner on activities ranging from COVID-19 testing, research and innovation projects, to town-gown initiatives and more.

"I can think of no better example of collaboration than the residency program. It really demonstrates not only the alignment of the two institutions' missions and values; it also—most importantly, I think—demonstrates the alignment within the community for the community," says James M. Record, interim dean of the Elson S. Floyd College of Medicine.

The new program aims to be a win-win-win for the community, university, and hospital. A 2013 study published in *American Family Physician* found 56 percent of family medicine residents stay within 100 miles of where they graduate from residency. Soon, Adams says, "Eastern Washington and northern Idaho will have more potential for new physicians."

That's a key mission of the medical school: training doctors to serve rural and vulnerable populations in Washington.

"It's rare to have an education program such as our new family medical residency based in a critical access hospital," Record says. "Commonly, those programs occur in large academic centers in urban areas. Some of the most underserved areas in our state are rural areas."

Finch Memorial Hospital, named for its benefactor, Spokane mining magnate John A. Finch, was built on campus in 1928.

In the mid-1940s, a group of concerned residents formed the Pullman Community Hospital Association, which incorporated and advocated for a hospital that would serve not only students but community members. Back then, the nearest community hospital was 15 miles away in Colfax.

The group leased the hospital building from the college and, within three years, built a new wing. The expanded Pullman Memorial Hospital was dedicated in 1951.

Twenty-five years later, the hospital district formed and soon took over hospital management. Around the same time, voters approved a \$3.7 million bond to again expand the hospital, re-dedicated in 1982.

When Adams arrived in 1992, on-campus parking for the hospital remained a challenge. So was keeping up with technology.

After two attempts, voters in 2001 approved an \$8.2 million bond to build a 95,000-square-foot, 25-bed, off-campus hospital. The \$28.5 million Pullman Regional Hospital opened in late 2004, just 1.3 miles from its campus location.

In 2018, WSU and the hospital formalized their partnership, signing a memorandum of understanding in recognition of continuing their long-standing collaboration. The two institutions work on health and wellness support and education, clinical affiliation agreements and workforce training, human resources and employee recruitment and retention, advancement through community and alumni engagement, and innovative health solutions.

"The university has had impact at a real fundamental level in improving the quality of health care in the community because of its relationships," Adams says. "When the university is involved, everyday levels of knowledge in the community go up. Quality of care in the community goes up. There's a broader benefit."

Recruitment for the residency program takes place this fall. Matches are announced mid-March. The first three residents arrive next summer, with three more coming in the summers of both 2024 and 2025. Together, Adams says, "We're training people to be the next generation of physicians, and we want them to be trained well and stay to serve our communities." ✨



PHOTOessay

PHOTOS ROBERT HUBNER
TEXT ADRIANA JANOVICH

BLUE RIBBON FAIRS IN THE EVERGREEN STATE



VIEW OF THE CENTRAL WASHINGTON STATE FAIR IN YAKIMA WHILE RIDING THE **SUNDOLA** CHAIRLIFT (ORIGINALLY BUILT BY RIBLET TRAMWAY COMPANY OF SPOKANE—ONCE THE LARGEST SKI CHAIRLIFT MANUFACTURER IN THE WORLD).

Washington state has nearly 70 ag fairs*...

*as listed by the Washington State Fairs Association

Syracuse, New York, hosted the country's first state fair in 1841, featuring attractions that still draw crowds. Produce displays, livestock exhibitions, blue-ribbon pies, pumpkins, and ponies are exhibited alongside advancements in science, technology, engineering, arts, and math—from 3-D printing to robots and drones. Washington State University is connected to all fairs across the state that host these timeless experiences.



THE DELIGHTS OF THE FAIR bring together folks to celebrate community—and have some fun. At state, county, and local fairs, you could pilot a virtual airplane or ride a camel, marvel at a homemade quilt or giant squash, get lost in a hay-bale maze or admire piglets.

There's nothing like the thrill of the midway—amusement rides, panoramic views from the Ferris wheel, carnival games and their vendors calling to potential players. Win an oversized stuffed animal for your sweetheart. Watch a child score a goldfish, swimming in a clear plastic bag.

Fairs in Washington state in 2019 attracted 3.3 million people, featured 68,000 exhibitors, garnered 136,000 hours from 5,600 volunteers, and offered an economic boost of \$397 million in business revenue and \$10 million in taxes.

Fair season runs March to October. From their agricultural roots and old-fashioned fun to showcases of modern creativity and innovation, Washington's fairs serve up a slice of Americana and tradition. Here, we celebrate their timeless aesthetic.

CENTRAL WASHINGTON STATE FAIR IN YAKIMA





Fisher scones debuted at the 1915 Western Washington Fair in Puyallup and remain a favorite at what's now the Washington State Fair. **PATRONS STILL ENJOY CLASSICS**—hand-dipped ice cream, elephant ears, deep-fried candy bars, funnel cakes, curly fries, corn dogs, other foods served on a stick—along with Hawaiian-style poke and new-in-2022 Glow Tea served in a lightbulb-shaped to-go cup. Some years, fairgoers have even gotten to taste alligator burgers, kangaroo sausages, and Manchurian scorpions.



...that were **back in the swing** in 2022!

magazine.wsu.edu/extra/wafairs

TIME GOES FAST AT THE FAIR. But, oh, what a ride—not just the Classic Coaster, Extreme Scream, Giant Slide, or all the amusements in Thrillville and Sillyville—but all of it. The entertainment. The activities. The oh-so-many things to see and do since Washington's fairs first started.

People have been “doing the Puyallup” since 1900. Yakima’s Central Washington State Fair originated in 1892, and the roots of the Spokane County Interstate Fair reach to 1886. In Walla Walla, the fair dates to 1866. The King County Fair in Enumclaw goes back even further—to 1863.

Early days featured vaudeville and high-wire acts, fiddler contests, a three-ring circus, log rolling, horse racing, and something known as auto polo in which Ford Model Ts pushed a ball between them toward a goal. There were dances too. In the 1930s, Puyallup’s dance hall was a main attraction. Each dance cost five cents.

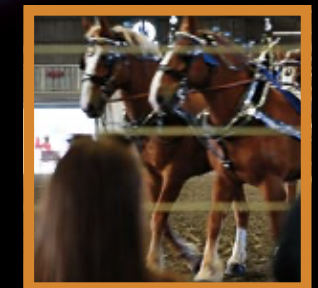
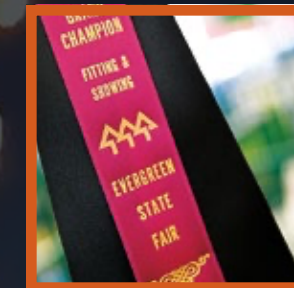
These days, entertainment includes concertgoing with musicians and bands from a wide array of genres—country, rock, R&B. Washington fairs have brought in Bob Hope, Clint Black, Michael Bolton, Boyz II Men, Faith Hill, Wayne Newton, John Denver, Weird Al Yankovic, Wynonna Judd, Dolly Parton, the Doobie Brothers, Los Lobos, the Goo-Goo Dolls, the Beach Boys, Blake Shelton—too many to name.

WASHINGTON STATE FAIR IN PUYALLUP

[a fair food smorgasbord: magazine.wsu.edu/extra/fair-food](https://magazine.wsu.edu/extra/fair-food)



Fairs are—and historically have been—**CENTERS OF COMMERCE, ENTERTAINMENT, AND EDUCATION.** Alongside artfully arranged Grange mosaics of apple, onions, potatoes, and other crops, Washington fairgoers have been able to see polar bears, tigers, and an exhibit on “bug-ology.” There are awards for photography and scrapbooking as well as traditional home arts such as canning, quilting, and pie-making. Buy a prized pig, goat, or dairy or beef cow from a 4-H and FFA kid. Or, at least, watch the animals shown in the arena after months of caring and feeding. Check out the other deals too—on hot tubs, mattresses, cookware, even cars and RVs.



Millions annually attend the fairs*

*3.3 million did so in 2019 (source: WSFA)

EVERGREEN STATE FAIR IN MONROE



Some fairs, such as the Central Washington State Fair, dedicate **ENTIRE BUILDINGS** to science, technology, engineering, and math (STEM) education, offering interactive games, displays, and lessons. The 1927 Pioneer Hall at Yakima’s State Fair Park features a 3-D printer along with straw rockets, a shadow wall, engineering challenges, and more.



From 4-H and Extension to alumni who work for fairs or serve on fair boards, **WSU CONNECTIONS** to fairs across the state reach far and wide and deep. Greg Stewart ('71 Ag.) was hired in 1972 by the Central Washington Fair Association as assistant general manager and retired in 2019 as general manager and fair board president. In 2018, he was given the Lifetime Achievement Award by the Washington State Fair Association. He was also chairman of and honored by the International Association of Fairs & Expositions, receiving the organization's Hall of Fame Award in 2010. Erin Gurtel ('97 Comm.) is the director of the Spokane County Fair and Expo Center. Her predecessor, Rich Hartzell ('71 Ani. Sci.) retired in 2019 after 13 years on the job. He also sits on the Washington State Fairs Commission along with Stewart and—as of summer 2022—these Cougs: Tim Schneider ('83 Ag. Ed., '90 MS Voc. Tech. Ed.), Paul Kuber ('01 PhD Ani. Sci.), Lori Williams ('03 Ag. Econ.), and Ron Crawford ('65 Ag. Ed., '75 Ag. Ed.). In fact, at that time, six of the eight commissioners were Cougs.



WSU PHARMACY AND NURSING STUDENTS WORK TOGETHER TO GIVE FLU VACCINATIONS AT THE CENTRAL WASHINGTON STATE FAIR.



Some fairs are recognizing all the sights and sounds can provide a sensory overload for people with autism and sensory-processing differences. The Spokane County Interstate Fair instituted **SENSORY DAY** for folks with sensory sensitivities. The special fair day features a touch-and-feel zone, critter-cuddle area, opportunity to meet a comfort dog, and chance to enjoy carnival rides without lights or sounds.

...and view thousands of exhibits*

*68,000 in 2019 (source: WSFA)

“One of the things we strive to do is to stay relevant. To stay relevant, we’ve got to keep up with what’s going on. One of our key functions is to educate. We think fairs provide the largest outdoor classroom.”

— WASHINGTON STATE FAIRS COMMISSIONER GREG STEWART '71

BACKGROUND PHOTO JOHN AUSTIN

SHORTsubject

BY LARRY CLARK



j u s t a s m a l l t h i n g m a k i n g a



WSU Regents Professor
John Browse



Molecular Plant Sciences
Director Michael
Neff



WSU doctoral student
Xin Xin

Global agriculture is in many ways indebted to scientists who tinker with a nondescript little plant called mouse-ear cress or *Arabidopsis thaliana*.

“The weed,” as it’s affectionately known among researchers, grows along roadsides or in the cracks of sidewalks where its small white flowers rise on stalks from a floret of rounded leaves. A part of the brassica family whose cousins include broccoli and cabbage, *Arabidopsis* is edible if you’re so inclined.

But the thing that makes *Arabidopsis* so important to scientists—such that it warranted a 2019 trip to the moon aboard China’s *Chang’e-4* lander—is the plant’s extremely small genome of only 125 megabase pairs and five chromosomes. In 2000, that genome became the first in the plant kingdom to be completely sequenced.

Since then, *Arabidopsis* has become the world’s favorite model organism for studying plant biology, genetics, evolution, and much more. Its impact is so ubiquitous, in fact, that some call *Arabidopsis* the fruit fly of the plant world.

At Washington State University, *Arabidopsis* gives faculty and students in the Molecular Plant Sciences Program a vital platform to explore the fundamental life processes of valuable crops such as wheat, barley, potatoes, mint, and cannabis.

Through a wide range of interdisciplinary research efforts, these WSU scientists help sustain high-yield agricultural production while protecting regional crops from disease, insect pests, drought, and other effects of climate change.

John Browse, WSU Regents Professor of biochemistry and molecular plant science, has been an integral part of the program since 1988. He first began working with *Arabidopsis* in 1983 when the tiny plant was just gaining notice as a versatile and easy-to-use experimental organism.

“*Arabidopsis* research started as early as the 1940s but really took off in the scientific community around 1975–1980,” he says. “The plant is extremely small so is easy to grow in controlled environments. It also has a very short life cycle and will produce seeds in only six to eight weeks’ time. So, for impatient scientists, it lets us progress through our experiments much faster than if we were studying another plant like corn, which you’re lucky to get one crop per year from.”

Browse was recently inducted into the National Academy of Sciences for his pioneering work in the field of plant biology. Specifically, he studies plant cell membranes and the lipid molecules they are composed of. His primary focus is on oilseed crops such as soy, canola, and sunflower that are often used for food, biofuels, and other bioproducts.

In 1994, Browse made a historic discovery that transformed the international food industry. Using his favorite “pet” line of *Arabidopsis*, he identified a gene that would make it possible to eliminate heart-damaging trans fats from many cooking oils and fats.

Trans fats, once a mainstay of margarine, baked goods, fried food, and even microwave popcorn, were eventually banned by the US Food and Drug Administration in 2018, though a few processed foods and snacks still contain them.

“The problem with most vegetable oils is they have a lot of polyunsaturated fatty acids that easily oxidize in the air and produce the off-flavors you get when it goes rancid,” says Browse.

“In order to stop that process, the food industry resorted to using partially hydrogenated oils, which produce the trans fats that have been shown to cause heart health problems.

“The gene we identified is the one that encodes the gateway enzyme to the synthesis of polyunsaturated fatty acids,” he says. “So it was possible to downregulate

big difference

BY REBECCA PHILLIPS

take a tour of the new WSU turfgrass farm with Michael Neff—a [Viewscape](https://magazine.wsu.edu/extra/turfgrass-tour) podcast: magazine.wsu.edu/extra/turfgrass-tour

that gene and prevent the formation of polyunsaturates in the first place. Then we no longer had to worry about rancidity or resorting to partially hydrogenated oils.”

Today, Browse and his colleagues are investigating oilseed crops as a renewable resource for the production of plastics, polymers, and biofuels—although they recently faced a small detour along the way.

Thanks to the pending demolition of Johnson Hall on the Pullman campus, Browse’s entire laboratory had to be packed up and moved across the street to the brand-new WSU Plant Sciences Building. There, protected by a key-code entry, he and other researchers enjoy state-of-the-art facilities and equipment.

Among those fellow researchers is Michael Neff, professor of crop biotechnology, who has been director of the Molecular Plant Sciences Program since 2009. This morning, wearing his signature Hawaiian shirt, he meets me at the building’s large glass doorway and cards me in.

“We are an interdisciplinary PhD program with about 40 faculty members from eight different university departments and four colleges,” Neff begins. “I like to think of our program as going all the way from the petri dish to the farm.”

Indeed, their doctoral students study topics ranging from fundamental plant biology, including the genes and proteins that control plant development, to real-world applications of that knowledge for crops and breeding programs. Neff says some students focus on bioinformatics, for example, while others tackle diseases of barley or cannabis. Quite a few still conduct research with that humble model organism *Arabidopsis*.

As we tour the quiet and spacious Plant Sciences Building, Neff points out a few highlights.

“On the first floor, we have the proteomics facility for researchers who are interested in specific plant proteins,” he says. “Some of the equipment can analyze secondary organic compounds, those unique proteins that make plants taste good, or be poisonous, repel or attract insects, aid in ripening, or make them good for food preservation or medicinal purposes.”

Down the hallway, painted a fitting shade of green, Neff opens the door to a climate-controlled growth chamber where rows of dot-filled petri dishes sit on a rack.

“Those are *Arabidopsis*,” he says gesturing toward the plates. “We can grow 2,000 seeds on one petri dish.” Across the aisle, another rack holds mature flowering *Arabidopsis* plants awaiting their scientific duties.

Neff says molecular plant sciences faculty and students share a number of other high-tech facilities as well as dedicated farmland.

“To understand how genes contribute to plant growth, we can make transgenic plants in our greenhouses where we can turn genes

off or on,” he says. “Then we can use our phenomics facility to collect data on things like plant growth rate and photosynthesis.

“When we want to study what’s happening at the cellular level, we go to the microscopy facility to look at cell structure and morphology. And when people are interested in gene expression, or genomics, we have an array of sequencing machines in the School of Molecular Biosciences.”

Neff shares a story about his own work with *Arabidopsis* that could help safeguard Pacific Northwest agriculture in the face of advancing climate change.

“We were studying how certain proteins contribute to seedling growth in *Arabidopsis* and discovered you can express the mutant form of a gene and make seeds twice as big,” he says. “So we transferred the same mutant form of the gene into an oilseed crop called *Camelina* and it also resulted in larger seeds.

“This allowed the seeds to be planted deeper into the soil where they could access more water. By increasing seed size and weight, we were able to enhance the crop yield in dryland farming situations. We’re now doing similar experiments in canola with the idea that it might help in years of low rainfall.”

Arabidopsis also plays a role in Neff’s research on Kentucky bluegrass, much of which is now taking place at WSU’s new Perennial Grass Breeding and Ecology Farm just east of the Pullman campus.

“Most people don’t know that Washington is number one for bluegrass seed production,” says Neff, who led construction of the farm during the COVID pandemic. “Eighty percent of the seed consumed globally is produced in Washington state. Ninety percent is grown in the Inland Northwest.”

As a perennial crop, Kentucky bluegrass requires a cold winter to flower and produce seed the following year, a process called vernalization. When winters are mild, seed yields are low. Xin Xin, Neff’s doctoral student, is conducting vernalization studies funded by the Washington Turfgrass Seed Commission in hope of protecting the industry as the Inland Northwest experiences warmer winters tied to climate change.

“Xin is working on genes related to flowering in Kentucky bluegrass,” Neff says. “The vernalization genes were all originally discovered in *Arabidopsis*. Now that we have fully sequenced the Kentucky bluegrass genome, we can identify those genes and characterize their expression during the vernalization process.

“These are the same genes that, in one mutant form, cause the difference between our winter and spring wheat,” he says.

“Winter wheat has to be planted in the fall in order to go through vernalization, so it can flower in the spring. Spring wheat doesn’t need to be planted in fall because one of the key regulating genes is turned off and doesn’t need winter to activate flowering.

“That’s a cool thing and something we want to do for bluegrass. Our work with the vernal genes could help maintain a stable and productive bluegrass seed industry in Washington state.” ✱



Left: USDA Research Associate **Shaun Clare** ’22 PhD studied barley crop genetics and hybridization at WSU. He is currently working on disease susceptibility screening tests for breeders. **Right:** **Camille Wagstaff** is the first entomology student to join the WSU Molecular Plant Sciences Program. She studies viruses that change plant gene expression and how those changes affect attraction of vector insects.

Feature

Bees have a surprising hero.

Vicious *Varroa destructor* mites feed off bees and weaken them, aggravating an already critical situation for pollinators. Chemical pesticides have been used to control the mites, but the parasites are starting to develop resistance to them.

Enter the fungus.

Metarhizium, a common mold-like fungus found in soil around the world, has spores that attack and kill *Varroa* mites. The spores are safe for bees, making fungal treatment a viable option.

Varroa mites. Researchers are experimenting with feeding fungal extracts to bees, and one fungi-ophile WSU student has even started constructing biodegradable bee hotels from mycelium.

Other WSU researchers study microscopic fungi in the soil to help plants take up nutrients, alleviating the need for as many chemical fertilizers. And, in partnership with Pacific Northwest National Laboratory (PNNL), engineers look to mimic

show antiviral properties of mycelium extracts in people.

When he saw bees feeding on mushrooms, and knowing that bee health is crucial for pollination, Stamets connected with Steve Sheppard, a professor in WSU’s Department of Entomology. Together, they developed a medicinal extract of mycelium that combats viruses in bees.

The bees face a major crisis, though. Parasitic *Varroa* mites suck fluids from bees, weakening

To make matters worse, colony collapse disorder accelerated around 2008, causing beekeepers to lose up to 50 percent of their hives. Although multiple factors cause bees in a colony to die, scientists found mites were deadlier than they used to be. They had formed a symbiosis with a virus that suppressed bees’ immune system.

“Colony health went from bad to really dismal,” Sheppard says. “It was difficult to keep bees alive.”

Metarhizium spores were already known to destroy mites, almost as well as chemical controls. The spores germinate on the exoskeletons of mites, drill in, and kill the parasites, while honeybees are immune to the spores.

...it’s fungi to the rescue



Fungi have emerged as a potential alternative for a vast range of uses. In years past, molds brought us penicillin and blue cheese. Now, mycelium—the rootlike tendrils under many fungi—is fashioned into biodegradable packaging, strong and fire-resistant building materials, and even hats and other clothes.

More than just delicious mushrooms, fungi have powerful abilities to break down plant waste, or even polyurethane and petroleum by-products. They can grow into strong materials at a tremendous rate, have medicinal properties, and keep ecosystems functioning.

Washington State University researchers are taking full advantage of those unique properties. Entomologists have developed *Metarhizium* to survive beehive temperatures and wipe out

and improve on a rot fungus that breaks down wood, a step toward more biofuel production.

Often unseen yet crucial for our ecosystems, fungi are proving to be heroes not only to the bees but perhaps to the world.

Mycologist and fungi enthusiast Paul Stamets, co-owner and founder of Olympia-based business Fungi Perfecti, develops fungi into applications ranging from medicine to biocontrol to habitat restoration. Stamets has also worked on projects that

bees’ immune systems and making them vulnerable to viruses.

“We say that usually without intervention the mites will kill a colony in about two years,” Sheppard says.

Chemical pesticides have been used for many years to control the mites, but the parasites’ rapid life cycle enables them to develop resistance pretty quickly. Beekeepers in the United States now have very limited chemical treatments to control the mites. “There’s a feeling of being near the end of the road there,” Sheppard says.

However, the fungal approach had not been explored much because *Metarhizium* couldn’t survive the high temperatures inside a beehive, around 95 degrees Fahrenheit.

With support from Stamets, Sheppard and the WSU research team of Jennifer Han, Nicholas Naeger, and Brandon Hopkins began a breeding program in 2016 to develop a strain of *Metarhizium* that could tolerate the heat.

Han, who led the effort, says the team uses other stresses on the fungus to build protection against heat. “We basically grew it on no food or very little food with the idea that if you stress out a fungus for one abiotic aspect, it can help cross-protect against others. So if it is stressed out nutritionally, it can help cross-protect against heat stress,” she says.

STAFF ILLUSTRATION



From left: Jennifer Han and graduate student Adam Ware check honey beehives treated with fungus in collaboration with Fungi Perfecti. Courtesy Nick Naeger

Han and the team also screened for virulence against the mites, going through tens of thousands of *Metarhizium* strains to identify one that was thermal tolerant and deadly to mites. “The term we like to use is directed evolution,” Han says.

Eventually the team developed a strain of the fungus that could survive the heat and kill off most of the mites.

Stamets, who contributed to the 2021 paper, was impressed by the WSU scientists’ success with fungi in helping bees. “It’s providing a real one-two punch, using two different fungi to help bees fight *Varroa*,” he told *WSU News*. “The extracts help bee immune systems reduce virus counts while the *Metarhizium* is a potentially great mite biocontrol agent.”

Naeger says the next step is to commercialize the strain. “We need to get this from the lab to the hands of beekeepers in an actual product that can be used,” he says.

For that to happen, Naeger says they’ll figure out correct dosages, timing of application, and delivery methods, then approach the Environmental Protection Agency for approval.

Since *Metarhizium* is sustainable and ecologically safer as a biocontrol agent, there’s also interest in its use for pests in other high-value greenhouse crops and organic agriculture. “I think that’s one of the most innovative parts, to develop a biocontrol agent that you’re constantly maintaining its viability, generation after generation,” Sheppard says.

During the research, entomologists found another ally in Katy Ayers, a WSU junior in bioengineering.

Ayers is a fungi superfan. Before transferring to WSU from Nebraska, Ayers built the world’s largest canoe made of fungus,

an eight-foot, buoyant vessel of mycelium. She grew the canoe for a state fair sustainability award, and it’s still on display at the Nebraska State Fair.

“Not everybody gets interested in fungi. Most people don’t even know about it,” Ayers says. After she watched *Super Fungi*, a documentary featuring Stamets, she built her world-record mycelium canoe in 2019 and the fungus only took a week to grow into the shape.

Ayers also started another mycelium project in Nebraska: bee homes.

Homes for bees need to be cleaned extensively to prevent

diseases and contamination. Mycelium bee homes are biodegradable, so they can be tilled into soil after use. Ayers and a partner successfully tested almost 40 of the mycelium structures.

She says a main reason she transferred to WSU was the work with fungi and bees. Ayers connected with Naeger and the other researchers to continue her work on bee homes.

With assistance from a Scott and Linda Carson Undergraduate Research Excellence Award, Ayers grows bee hotels from mycelium that incorporate the extracts created by Sheppard and Stamets for improving bee health. The bee hotels have tiny holes for solitary bees that specialize in pollinating specific plants.

Ayers has a lot of future fungus plans. She sees potential for mycelium fishing bobbers to replace plastic ones and hunting blinds that can eventually degrade into the soil if left in the woods.

These fungus-related projects give her a sense of accomplishment in helping the planet. “I used to feel really powerless, but fungi—they make me feel powerful,” Ayers says. “Fungi are really our friends. They’re here to help us.”



PHOTO PETER WATERS/ADOBE STOCK

Tanya Cheeke knows fungi are a powerful asset, particularly for plant health. An assistant professor of microbial ecology at WSU Tri-Cities, Cheeke researches ecology and evolution of plant-microbial interactions.

Some of her recent work looks at mycorrhizal fungi and their role in plant health, particularly for wine grapes in Washington state.

Mycorrhizal fungi thrive on plant roots, where the microscopic organisms extract nutrients from soil and provide them to plants in a symbiotic exchange for carbon. The fungi require carbon to survive.

Based on this relationship, Cheeke examines which mycorrhizal fungi will be most beneficial to plants. She works with a group of symbiotic soil fungi called arbuscular mycorrhiza.

“They’re thought to be one of the most ancient symbioses with plants on earth,” Cheeke says. “There are fossils dating back at least 400 million years.”

Not only do plants thrive because of the mycorrhizal relationship, the carbon taken in by fungi—up to 5 billion tons annually—would otherwise be released into the atmosphere as carbon dioxide, aggravating climate change with more greenhouse gases.

Still, more research is needed to understand the full extent of the fungi role in soil and plant health. For example, Cheeke notes that under high-nutrient conditions, such as when fertilizer is added to soil, mycorrhizal fungi can become a carbon cost on the plant and take more than they return in nutrients.

It’s a complex system. Cheeke and her research team, including her collaborator,

Extension assistant professor and viticulture expert Michelle Moyer, have even seen significant differences between merlot and chardonnay grapes in reactions to mycorrhizal treatments. A long-term goal is to find the right types and amounts of the fungi to support different plants.

“You could potentially reduce fertilizer use by cultivating certain types of mycorrhizal fungi in the soil,” she notes. “If we can identify certain plant-fungal combinations that are beneficial in certain environmental conditions, we can perhaps identify some drought-tolerant fungi or locally adapted fungi that we could add back.”

Cheeke’s investigation extends to ecosystems beyond agriculture, including Palouse Prairie restoration. Soil fungi are “important in both natural and agro-ecosystems, in terms of helping to improve nutrient and water uptake,” Cheeke says. “They can provide protection against pathogens, drought, stress, all sorts of different things.”

Fungi not only build up plants; they’re extraordinarily effective at tearing them down. A rotting tree on a forest floor shows the effectiveness of fungi, such as white rot fungus, in breaking down wood.

Even though that process takes quite a while, it offers a model to tap into one of the best ingredients for biofuel. Lignin forms the cell walls in plants and is the second most abundant carbon source on the planet, but it has tough molecular bonds. Chemists have attempted to efficiently make valuable products from lignin for a century without success.

Xiao Zhang, a professor of chemical engineering at the WSU Voiland School of Chemical Engineering and Bioengineering with a joint appointment with PNNL, worked with his colleague Chun-Long Chen to create a nature-mimicking enzyme, one that improves on fungal mechanisms of breaking down lignin.



WSU Tri-Cities biologist Tanya Cheeke researches fungi that can benefit plants and ecosystems. Courtesy WSU School of Biological Sciences

Natural enzymes, like those in fungi, are much more benign than chemical methods that require high heat and consume more energy than they produce. However, fungal and bacterial enzymes degrade over time, and they’re too expensive for industrial use.

Chen and Zhang’s team recognized the shortcomings of natural enzymes and used protein-like peptoids as a scaffold to surround the enzyme.

“The side chain of peptoids can carry and enhance the fungal enzyme,” says Zhang.

Chen, a senior research scientist at PNNL and an affiliate professor in chemical engineering and chemistry at the University of Washington, brought his peptoid expertise to the project.

Peptoids mimic the function of proteins and, in this case, self-assemble into nanoscale tubes to provide higher stability and more tunable and active surfaces than natural enzymes.

The new stable enzyme survives much higher temperatures than a natural enzyme, which can increase the speed of degrading the lignin. The results were pub-

lished in a recent issue of *Nature Communications*.

The biomimetic enzyme is a breakthrough in the effort to digest lignin and make compounds for airplane biofuels and other uses. Zhang and Chen now want to scale up the process and enhance its reactivity.

The world could see even more breakthroughs, from cleaning up waste to building sustainable products, as we begin to dig into the underappreciated abilities of fungi.

“Fungi are the forgotten kingdom on the planet,” Sheppard says. “They are a vastly underutilized, untapped resource. There is little reason not to tap this potential and try to make the world better.” *



"DASHING THROUGH THE SNOW" ... PULLMAN-STYLE (PHOTO ROBERT HUBNER)

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Doneen Arquines on *Top Chef Masters* set
Photo J. Emilio Flores

Cooking up a show

BY BRIAN HUDGINS

Doneen Arquines's summer camp contains Quickfires, wars, and last chances.

It comes with the territory of being executive producer of *Top Chef*, the Bravo network cooking show that debuted in March 2006 and is set for a twentieth season. Arquines started as a production assistant for the first season in San Francisco and has been on board ever since.

"Tom (Colicchio), our head judge, kind of calls it *Top Chef* Summer Camp because we come together once a year and do this crazy thing for a few months," says Arquines ('05 Comm., Anthro.). "Then it's over and we don't see each other again until the next year."

Arquines, who grew up in Marysville, north of Seattle, chose Washington State University to explore dual interests in television and anthropology. "The communication and anthropology programs were both where I wanted to be—they were high-level and respected," recalls Arquines, who had never visited the Pullman campus before coming for freshman year.

The Murrow College of Communication gave Arquines plenty of opportunities to volunteer at Cable 8 and produce shows. "I was very lucky to have Neal Robison as my advisor before he retired," Arquines says. "He was very supportive and so was (scholarly associate professor) Marvin Marcelo. Both of them were very much people I could go to and ask questions anytime I had them."

When Marcelo asked Arquines during her senior year, "What do you want to do?" the answer was go to New York or Los Angeles. "He introduced me to some alumni who were down in LA and had already started to establish themselves," Arquines says. "That really kind of helped me decide LA was going to be where I wanted to go."

A couple of weeks after she moved, Arquines interviewed for production assistant job on *Top Chef*. Even though it was the first season for the program, the production company behind the show *Magical Elves* had an established record as the producers of *Project Runway*. The format does not require year-round shoots, so early on Arquines had time to work on other projects as she was establishing herself in the industry. These

days, she works on *Top Chef* year-round. "I have really grown with the show," she says. "*Top Chef* has kind of been my life, and I have been able to move up through the ranks on the show."

Doing many jobs meant Arquines had a hand in setting up challenges for the show, scouting suitable locations for filming, and eventually booking guest judges. That variety gave Arquines insight into how all the pieces fit together. She routinely strikes a balance between introducing new elements without jettisoning the most popular ones. "You definitely want to keep the audience that has been with you all these years happy with things they are familiar with, but you also want to keep them entertained with things they haven't seen before," Arquines explains.

The city locations have functioned as characters on the shows. Destination cities such as Boston, Miami, and Chicago have provided backdrops for fan favorites to battle for the title of "Top Chef."

"The cities naturally lend themselves to different creatives we have never seen before," Arquines says. "The US is so regionally diverse that we are able to get new dishes, new ideas,

new chefs, and everything into the show in an organic way.”

That has been Arquines’s favorite part of her journey—digging in and learning about the food culture in various cities. Arquines says she has not necessarily become a better chef, but her range of food knowledge has increased.

“I was a very picky eater growing up, but being on the show and being exposed to really good food and great chefs has expanded my palate,” Arquines says. “There are things I wouldn’t touch as a teenager that I now love.” ✱

Hospitality is what I know

BY ADRIANA JANOVICH

He was at a local pizza place when he got the call. It was the governor’s office, letting him know that Jay Inslee needed to talk with him within the hour.

Anthony Anton left the restaurant to await the news. Soon, Washington state’s governor was informing him that, because of the rapidly spreading novel coronavirus, dine-in service at restaurants



Anthony Anton leads the Washington Hospitality Association. *Courtesy WHA*

statewide was shutting down the next day: March 16, 2020.

Just over a third of the state’s full-service restaurants and taverns—nearly 2,400 out of some 7,000—were unable to recover due to that initial shutdown and ultimately went out of business, according to Anton (’93 Poli. Sci.), CEO of the Olympia-based Washington Hospitality Association (WHA), which tracks the data. During the second but shorter shutdown in November 2020, another approximately 1,000 restaurants statewide closed permanently.

“There hasn’t been a darker time in the industry,” Anton says.

COVID-19 threw the hospitality industry into crisis and, Anton says, it could take years—he estimates four or five—before it rebounds. Since the start of the pandemic, Anton has been working closely with hospitality constituents and state officials from public health experts to the governor to help craft public policy and secure relief surrounding COVID-19.

“Hospitality is what I know,” says Anton, who “grew up in a very, very Greek household.” All four of his grandparents immigrated from Greece. One grandfather was a dishwasher at the famed Historic Davenport Hotel in Spokane. The other opened a café in Orting. Anton’s father later owned a series of restaurants in Puyallup.

“That was our life. That was our family. Everyone was involved,” Anton says. “And

that is where my heart is. My heart is in small business. It’s in a person opening a place and chasing a dream.”

Today, the WHA has about 6,000 members representing restaurants, lodging, vendors, and entertainment venues statewide. It’s “the bridge between the hospitality industry and government,” Anton says. “We want Washington to be the best place in the world to run a restaurant or hotel.”

Under his leadership, the association has advocated for and helped distribute more than \$500 million in state and local grants for hospitality businesses affected by the pandemic. It has also helped secure an additional \$500 million in state and local tax relief. And it has delivered more than \$10 million in value to members in each of the first two years of the pandemic—through webinars, consulting, legal and regulatory guidance, and more.

While dine-in was no longer an option, some establishments were able to pivot, switching to takeout or delivery business models. Still, Anton says, “We let (much of) our workforce go for the better part of eight months. That’s what makes us uniquely impacted by the pandemic.”

Today, he notes, “We’re still short [on] about 23,000 workers. And our vendors are short truck drivers. We have major challenges to address, but people are starting to feel optimistic.”

Since Anton took the helm in 2006, the WHA has tripled in size, merging trade organizations for state restaurant and lodging industries. It helped reestablish a state tourism department after a decade without one and helped shape more than 125 state laws, mandates, and regulations, including the state’s unemployment insurance system. WHA also worked on the privatization of liquor sales and was instrumental in creating the state’s family leave program.

“My job is never boring,” says Anton, who oversees about 50 people and emphasizes teamwork. “Anthony has an innate ability to find and recruit wonderful leaders,” says Phil Costello (x’89), WHA’s chief operating officer. “He really values opinions that are different from his own and works to make sure diverse voices are included in decisions.”

The association recently invested \$250,000 at Washington State University to establish an up-to-date industry financial health dashboard. Anton sits on the WSU Hospitality Business Management Advisory Board and was inducted into WSU’s Hospitality Hall of Fame in March. He’s known for hiring WSU hospitality alumni to work for the association—more than 20 in all.

A few of the hospitality industry trends he predicts include the increased use of technology, such as QR codes and robots, for ordering, scheduling, and delivery, as well as continued emphasis on outdoor dining. “Outdoor dining is going to be more permanent,” Anton says. “It brings us out into the community, and it’s going to be a big part of who we are going forward.”

His latest pilot project spotlights Pullman. He’s working to create a city-state-WSU partnership to test and study best practices around industry sustainability, then inform industry leaders and others nationwide. Its working title: “Pullman Saves the Planet.”

Anton typically visits Pullman for two weeks each year, often repeating to hospitality students some of the best advice he says he’s ever received in the industry: “Treat everyone like they’re the best guest ever.” ✱

The Wright career

BY WENDA REED

“Failure is the best teacher in the world,” says Mark Wright (’89 Comm.), “if you make the right correction.”

Attracted to Washington State University by its bowling team and taking business classes because he thought it was what he should do to make money, Wright was flunking out. “My provost recommended I go home and figure it out,” he remembers. “I came back and tried broadcasting. My professors and administrators at Murrow College took a student who was struggling to find his way and sparked in me a passion that lives to this day. Once I aligned myself with my abilities, I did well.”



Mark Wright. *Courtesy KING 5*

He did very well, capping a 34-year career in local broadcasting with four Emmy Awards and induction into the 2020 Murrow College Hall of Achievement.

Like many Murrow students, he began his career working for WSU’s Northwest Public Radio station. Now known as Northwest Public Broadcasting, the network turns 100 this year.

“One of my professors, Betsy Krueger, told me to take a paid internship at KBSU radio in Boise as a legislative reporter during my last semester—best advice I could have gotten.” All the professors, especially Glenn Johnson, longtime mayor of Pullman and announcer for Cougar football games, helped students find their first jobs in the industry. More than three decades later, Wright and Johnson remain friends.

Wright’s first job out of college was with KXLY radio and TV station in Spokane. He started in the overnight radio position at five dollars an hour. “I looked about 12 years old and frightened,” he says, “so not ready for TV.” He slept in the sewing room in the home of the parents of his future wife, Jamie (Brown) Wright (’91 Ed.). “Her father would wake me up because I was a heavy sleeper, to tell me there was breaking news and I needed to go into the station.”

Wright ended up staying 10 years at the Spokane station, transitioning to reporter, then evening anchor. He won his first Emmy for a story about a multiracial couple shot by a white supremacist. After more than 4 years with KSTU-TV in Salt Lake City, Wright got a chance to work in his home market. He was born in Seattle and grew up on the family organic farm in Ferndale. He spent 8 years at the Fox affiliate, KCPQ 13, and 10 and a half years at KING 5, the last 6 years as evening anchor.

“I’ve done everything I wanted to do. My wildest dreams have been blown away. Doors kept opening and opening and opening,” he says, downplaying his own hard work to continually improve his writing, reporting, and on-camera persona. His goal, always, has been to “honor people by telling their stories ... to be completely human first and then a journalist.”

He earned his other three Emmys for coproducing a documentary about a young woman who went missing and was killed, for a feature on a local casino preparing for a potential mass shooting, and for news anchoring.

“The biggest story I covered was the pandemic,” he says. He pushed his drum sets to the side of a room in his Mukilteo home so that it could become his home studio for remote broadcasting.

The drum sets are back to the front of the room since Wright left his position at KING 5 in February. “I was a band geek in high school,” he says. “During the pandemic, I felt I needed a drum mentor to make progress.” He has been receiving lessons from Ben Smith, drummer for the rock band Heart. The drums can be loud enough for the whole neighborhood to hear. “I liked when a kid getting off the school bus started dancing to my music.”

As he transitions from broadcasting, Wright will be wearing many hats—and a pair of muddy boots.

He plans to join a mortgage lending firm in Seattle, partly because, like broadcasting, “it relies on who you know and who you can trust,” he says. “People come up to me all the time and say they miss me on the news; I’m looking forward to getting to know them face-to-face.”

The downtown Seattle Rotary Club, where he served as president from 2017 to 2018, will continue to be a big part of his life

because of its emphasis on service, as will participation in the Community Development Round Table and local charities.

And the muddy boots?

Wright gets those from helping his two older brothers run Wright Brothers Farm near Ferndale. It's an extension of an organic vegetable farm run by Wright's uncles in the 1970s on property settled by his great-grandparents in 1903. Neighbors called it the "hippie farm," and Wright and his brothers worked in the fields as kids. His mother still lives on the farm; his oldest brother left work as an attorney and CPA to run it full-time; and the middle brother, an aerospace manufacturer, designed the irrigation system and automated greenhouses.

No matter how many directions his life takes, the farm is a place where he and his family—including wife Jamie, sons Brandon and Austin, and all their cousins—can stay grounded. *

Mountain of a legacy

BY DEVIN ROKYTA

Mark Strother ('83 DVM) was a skilled mountaineer who had his sights set on summing the tallest peaks on the globe. He had recently graduated from Washington State University, married, and purchased a small animal practice in western Washington.

But, in 1986, on a fateful climb to Mount Robson, the highest point in the Canadian Rockies, Strother and his climbing partner's tracks stopped just 100 feet from the summit.

Not long after his death, his family established the Dr. Mark Strother Endowed Scholarship to honor his legacy and to support veterinary students. Thirty-five years later, the fund is still helping Cougs achieve their dreams.

From an early age, two things were clear about Strother: he had a deep love for animals,



Mark Strother summiting in 1982.
Courtesy WSU College of Veterinary Medicine

"It is an impressive mountain, notorious for its weather," Soos says. "There really isn't any easy way up that mountain, and I told him I wasn't in any shape to do it."

Strother eventually found a climbing partner, Ken Nelson, an experienced 42-year-old mountaineer.

The day before he was to leave for Canada, Strother sat down for dinner with his wife and Lundblad, who had just flown in from New York City where he was attending medical school.

"My plan had been to surprise him and go on a couple of local climbs because I hadn't been doing much climbing," Lundblad says. "He asked me to join him on his climb of Mount Robson, but there was no way I was in any kind of condition to do that."

The friends made an agreement to get together when Strother returned from his climb, but that gathering never happened, as Strother died on the mountain. The cause of the fall that ended his life was never determined.

"It is pure conjecture on my part, but as strong of climbers as they both were, it was some objective hazard they had no control over," Soos says. "On that side of the mountain, if you get pulled down, it is a 60-degree slope. There is no chance for survival."

Soon after Strother's death, his family established the scholarship in his name. Recipients must show substantial compassion for people and their animals and have an interest in practicing small-animal medicine. It has been awarded to more than 30 third-year students, including James Schmidt ('21 DVM) in 2020.

Strother also had a lasting impact on those who knew him.

"I think about him pretty much every day," says Lundblad, now 62 and semi-retired from a career in medicine. "In a lot of ways, he was as close as one of my brothers to me."

Soos, too, often thinks of his friend and has made a personal commitment to donate yearly to Strother's scholarship.

"He had such an impact on me and others," Soos says. "If I could talk to him again, I would say, 'We wish you were still here to enjoy the love of family, friendships, and the warmth of the autumn sun. We miss you. The memory of the life you lived has given strength and purpose to others.'" *

and there was no keeping him away from the mountains.

As a teenager, his friends and family remember, he would bike to a nearby veterinary clinic in his hometown of Yakima to volunteer. When he wasn't at the clinic or school, his golden retriever, Sampson, was likely in tow.

"It was amazing to watch them because Sam hung on every motion Mark made," Strother's friend Jim Lundblad says. "Mark truly loved that dog."

Strother was a driven and committed student and had his heart set on becoming a veterinarian, but he also was determined to conquer the outdoors, mountain by mountain.

His passion for the outdoors was shared by his close friends, Steve Soos ('81 Math.) and Lundblad. The trio spent nearly every weekend in the summers hiking, rock climbing, and summiting area peaks before Soos and Strother graduated high school in 1976 and headed to WSU.

Shortly after graduation, Strother married his wife, Susan ('79 Ani. Sci., '82 MS Vet. Sci., '83 DVM). After completing residencies in California, the couple returned to Washington, where they purchased a small animal clinic in Monroe.

Nancy Strother, Mark's sister, remembers how dedicated her younger brother was to his clients and patients.

"Mark had a real love for animals," she says.

Early in the summer of 1986, he began making plans to climb the 12,972-foot Mount Robson and approached Soos about joining the expedition.

Keys to success in roles no matter how brief

BY ADRIANA JANOVICH

Daniel J. Bernardo was an administrator at Washington State University for 14 years, first serving as dean of the College of Agricultural, Human, and Natural Resource Sciences, then provost and executive vice president. Between the summers of 2015 and 2016, immediately following the death of President Elson S. Floyd, he filled in as WSU's top executive.



Daniel J. Bernardo receiving WSU Alumni Award in 2016. Photo detail Robert Hubner

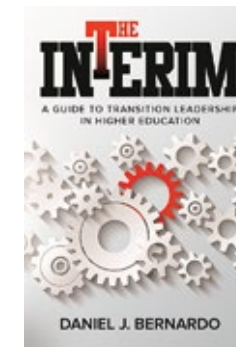
That yearlong stint inspired *The Interim: A Guide to Transition Leadership in Higher Education*. Drawing on his own experience as well as more than 30 interviews with other former or current interim ad-

ministrators, Bernardo ('85 PhD Ag. Econ.) addresses key tasks and moments—from developing a 30-day plan to the eventual handoff.

"Interim leaders are thrust into positions for which they likely have little direct experience, often with little preparation, and sometimes at the most inopportune times," Bernardo writes in the introduction to *The Interim* (2022, WSU Press). In the book, he details five stages of interim leadership: positioning for success, leveraging the front end, executing a 30-day plan, and evolving leadership, practices, and culture before turning over the role to the permanent hire.

Bernardo's start as WSU's interim president was "tumultuous." WSU had just received legislative approval to launch a medical school. The FBI informed him that an eastern European country was using the campus network to spear-phish federal agencies. Wildfire smoke posed a public health threat. And a conservative watchdog group contacted FOX News after finding online syllabi for three comparative ethnic studies courses that, the station correctly alleged, contained statements infringing on students' free speech.

Those challenges illustrate the trials and tribulations of interim administrators in higher education, writes Bernardo, a recipient of the Alumni Achievement Award, the WSU Alumni Association's highest honor. His handy how-to includes checklists and strategies for handling difficult situations such as the ones he encountered. While stressful, they don't last forever. "A month later, however," Bernardo notes, "all was well." *



NEWmedia



Making Space for Women: Stories from Trailblazing Women of NASA's Johnson Space Center

EDITED BY JENNIFER M. ROSS-NAZZAL '04 PHD HISTORY
TEXAS A&M UNIVERSITY PRESS: 2022

One made the coffee every morning. "That was just standard operating procedure," she explains, noting one boss never called her by her name. It was always "Young Lady."

Another, in her first job out of high school, babysat for astronauts after work. Still another, a mathematician, was asked to fill in for two weeks for a secretary who was on her honeymoon. When she retired as an engineer nearly 40 years later, NASA hired 10 men to replace her.

Throughout the history of the National Aeronautics and Space Administration and American space exploration, women and their contributions have remained relatively unknown. Historian Jennifer M. Ross-Nazzal noticed "a marked absence" and set about gathering their stories. The result is this volume featuring the personal stories of nearly two dozen NASA women.

Their stories are told in their own words, edited from transcripts from the Johnson Space Center Oral History Project, which started in 1996. As of last year, more than 1,400 interviews have been recorded.

Making Space for Women lets readers hear directly from 21 female workers—from secretaries and nurses to astronauts, flight controllers, technicians, senior managers, and more—whose narratives are generally overlooked. Ross-Nazzal gives them a platform.

Many of these women faced adversity and persevered. Some grew up poor. Some

NEWmedia

didn't go to college. Some dreamed of being astronauts as young girls. Often, they were the only woman or one of few women in their work group or the first woman in a department or particular role. They offer insiders' views of NASA—from day-to-day operations and workplace dynamics to personal interactions with famous astronauts, including John Glenn and Alan Shepard, and details such as NASA engineers keeping *Playboy* calendars on their desks and pictures of pinup models inside large cabinets in the 1970s.

Ross-Nazzal's compilation of their struggles and dreams, careers and legacies is conversational, approachable, inspirational, and powerful—a perfect read for girls and young women interested in science, technology, engineering, and math, or whose career aspirations include working for NASA. Women who work or have worked in STEM or for NASA would also be interested in this book of well-edited personal histories.

—Adriana Janovich



Pioneering Death: The Violence of Boyhood in Turn-of-the-Century Oregon

PETER BOAG
UNIVERSITY OF WASHINGTON
PRESS: 2022

His father slapped him, commanding him to tend to his chores. Instead, the 18-year-old marched into the farmhouse where he lived with his parents and siblings, grabbed his father's rifle, and shot him in the back of the head before turning the weapon on his mother and a community member who had stopped to chat.

The more historian Peter Boag learned about the killing in west Linn County—and its place in the larger social and cultural contexts of nineteenth-century Willamette Valley—the more it disturbed him. The history professor and Columbia Chair in the History of the American West at Washington State University opens his latest book with a scene that the local newspaper described in 1895 as “wholesale butchery.” He uses the triple murder as a gripping entry into the landscape of western Oregon in the mid to late 1800s.

“Rural Oregon was a dangerous place for children,” he writes, noting boyhood in particular was rife in that era with disease and accidental deaths—from drownings to hunting accidents and more. His well-researched work examines the perils, pitfalls, and paradoxes of Pacific Northwest pioneer history: the hidden childhood traumas of the American West, the inherent violence of Manifest Destiny, anxieties surrounding global capitalism, and rural and agricultural decline.

The day before the killing, Loyd Montgomery, who was “descended from an esteemed pioneer family,” left to go hunting without notice or permission. When he returned, he was admonished by his father for shirking farmwork and instructed “to go and cut some wood.” Loyd was arrested the next day for murdering his parents, John and Elizabeth, and Daniel McKercher, proprietor of the local gristmill, who “sided in with father when we were quarrelling,” Loyd said in the *Oregonian* on November 26, 1895.

Just before the shooting, McKercher and the Montgomery family patriarch, an impoverished farmer, had been engaged in conversation about the persisting economic depression, general scarcity, and mounting debt. Hops prices were down. Uneasiness was increasing. Society was rapidly industrializing and urbanizing. The agrarian—and often romanticized—way of life was in crisis.

Boag's scholarly exploration connects the Montgomery murders to their place and time—during a changing economy, as rural populations were decreasing and depression was setting in, a generation or two removed from Oregon pioneers' westward expansion, in the aftermath of the so-called Indian wars and

killing of missionaries Marcus and Narcissa Whitman.

He weaves in stories of early settlers, many with ties to the Montgomery family, as well as the chores and routines of daily farm life, brutality of boyhood, and problems of manliness in mid to late nineteenth-century Oregon. This interesting analysis will make readers glad they didn't grow up as boys in that era.

—Adriana Janovich



The Cascade Killer: A Luke McCain Novel

ROB PHILLIPS '78 COMM.
LATAH BOOKS: 2020

A father and son snag a black bear near Chinook Pass during their first hunt of the season and come across human remains—an ear among the animal's stomach contents. Luke McCain, a Yakima-based Washington State Department of Fish and Wildlife officer who also just happens to be a WSU alum, is called to the scene along with his trusty sidekick.

Jack, a yellow Labrador retriever, leads McCain and a crew of sheriff's deputies to what's left of a Native woman's body. A second body is discovered a month and a half later. Soon after, another is found. Then, another. McCain is at the scene each time.

While a work of fiction, this timely and gripping narrative set largely in the wilds of Washington's Cascade Mountains echoes recent real-life headlines publicizing the epidemic of missing or murdered Indigenous women. Along with the murder mystery, the fast-paced plot features plenty of action and intrigue—a jailbreak, run-ins with poachers and wild animals, steak dinners with an attractive young FBI special agent, and glimpses into the killer's mind.

Alumni Association News

Nowhere like home



MARIAH MAKI is thrilled to come home.

She returned to Washington State University at the beginning of September as the sixth WSU Alumni Association executive director since the position was created in 1934 and the first woman to assume the role. She will also serve as associate vice president for advancement.

“Honestly, WSU is where my heart is,” Maki says. She grew up on the Palouse and worked at WSU from 1998 to 2014 in admissions and the WSUAA. “My son Dylan was born in the old hospital right on campus.”

Maki brings 23 years of higher education administration experience to the position. Since 2014, Maki has worked for the foundation and alumni development at the University of Arizona in Tucson.

When Tim Pavish ('80 Comm.) retired in June after 18 very successful years as WSUAA executive director, Mike Connell ('85 Busi.), vice president of advancement and CEO of the WSU Foundation, knew he had to find the right person to carry on the legacy. Connell says Maki fits WSUAA's needs perfectly as the association embarks on the next era, calling out

her professional success, innovative ideas, and deep ties to the Palouse and WSU.

“Her experience and her energy just jumped out at me, and I said, ‘Holy cow, she's just what we're looking for,’” Connell says.

WSU is evolving into even more of a statewide system, he says, and the WSUAA also will increase its efforts on campuses beyond Pullman. It's a vision that Maki shares with the WSUAA team.

“The Alumni Association team has worked so hard with engaging our alumni, both through membership and events, virtual and in person. I think we can build upon what they're doing, but involving more of our multiple campus system,” Maki says. “Each of our campuses is unique with fantastic alumni bases.”

Volunteers especially drive WSUAA's success, Maki says. “They give of their time, talent, and treasure, but they're also helping other Cougs to find an affinity that they may have not had with the university.”

Maki is diving right into the new role by traveling all over to visit Cougs. “I'm looking forward to hearing from all of the alumni, whether we're in Wisconsin or California or anywhere in the state,” she says.

No matter where she goes, though, Maki loves what she's doing. “There's really nowhere like WSU,” she says. “It's a dream for me to work with alumni at all of our campuses and help grow the Cougar family.”

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Rob Phillips demonstrates his deep, first-hand knowledge of central Washington's backcountry in this quick and engaging read. And his writing style is wholly approachable. He writes about what and where he knows—from the Lower Naches and White Pass to Rimrock Lake and Cle Elum. In addition to lots of central Washington references, the avid outdoorsman includes plenty of jokes about the Oregon Ducks.

He's racked up 30 years' worth of newspaper columns focusing on the great outdoors. Phillips has been writing the Northwest Sportsman column for the *Yakima Herald-Republic* since 1991.

Readers who enjoy this page-turner are in luck; Phillips wrote two more Luke McCain novels in 2021 and another in 2022.

—Adriana Janovich

BRIEFLY NOTED

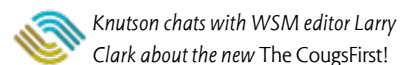
Elite and True: Leadership Lessons Inspired by the US Navy

JAMES BARNHART '84 ELEC. ENG.

GREENLEAF BOOK GROUP PRESS: 2022
James Barnhart translates real-life experiences in the US Navy's Officer Candidate School, Nuclear Power School, and submarine service into insights that readers can apply to leadership situations in their own lives and careers.

THE COUGSFIRST! PODCAST

Some of your favorite Cougs tell their stories to host Kelsey Knutson ('12 Busi.) on *The CougsFirst! Podcast*, launched in July by the CougsFirst! business network. Listen to WSU legends like "Throwin' Samoan" quarterback Jack Thompson ('78 Busi.), leaders like WSU President Kirk Schulz, and entrepreneurs like Tony Poston ('08 Poli. Sci., '11 Crim. Jus.), as they share their insights and Coug tales. You can find the podcast at linktr.ee/cougsfirstpodcast.

Knutson chats with WSM editor Larry Clark about the new *The CougsFirst!*

Podcast on the magazine's own podcast, "Viewscapes": magazine.wsu.edu/podcast



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CLASSnotes

JOHNNETTA B. COLE, who launched her career as an activist and educator at Washington State University in 1964, received the ATHENA International Global Award.

The award—established in 1994 and presented by chambers of commerce, women's organizations, and universities, recognizes leaders who have achieved professional excellence—work to improve quality of life for community members, and actively assist others, particularly women, in realizing their leadership potential. Past recipients include the late US Supreme Court Justice Ruth Bader Ginsburg and former Secretary of State Condoleezza Rice.

ATHENA International, founded in 1982, is a nonpartisan nonprofit dedicated to building a global pipeline of women leaders from the classroom to the boardroom.

"In the spirit of an African proverb that says, 'It does no harm to be grateful,' I want to express my profound gratitude for receiving this prestigious ATHENA Global Leadership Award," Cole said in a news release. "The very best way to demonstrate my gratitude is to continue to carry out the kind of work the ATHENA Award stands



COURTESY JOHNNETTA B. COLE/FACEBOOK

for: to do work that is marked by excellence and creativity, to be of service to others, and to help women soar to the height of their potential."

At WSU, Cole taught anthropology, helped found the Black studies program, and served as the program's first director. She was named "Outstanding Faculty Member of the Year" in 1970.

In 1987 she became the first Black woman president of Spelman College, the country's oldest college for Black women. She also served as president of Bennett College.

After retiring from academia, Cole directed the Smithsonian National Museum of African Art. She was also the first Black chairperson on the board of United Way of America and has held leadership positions in numerous other boards and organizations.

She currently serves as chairperson and president of the National Council of Negro Women, dean of the Herndon Directors Institute, and member of the Dr. Maya Angelou Foundation.

BY ADRIANA JANOVICH

60 KIM HERMAN ('67 Poli. Sci.) is interim president and CEO of the nonprofit National Peace Corps Association. Herman was a Peace Corps volunteer in the Dominican Republic from 1967-1969 and has more than 35 years of legislative experience.

70 LINDA CARLSON ('73 Comm.) and **CELESTE KARDONSKY DYBECK** ('74 Nursing) were featured at the summer 2022 *Fiber & Beyond* exhibit at the Latimer Textile & Quilt Center in Tillamook, Oregon. Carlson, of Sequim, used scans of 1940s *Saturday Evening Post* and *Collier's* issues to design fabric that was sewn into a shirt. Dybeck, a Jamestown S'Klallam elder of Port Townsend, created her Kardonsky Family Tree Button Blanket to honor her late parents and their family. **ROSS HARRISON** ('74 Wildlife Biol.) received a Lifetime Service Award from the Community Bankers Association of Georgia for more than 39 years of dedicated service to the community banking industry. Harrison is senior vice president and chief credit officer at Flint Community Bank in Albany, Georgia.

80 JEFFREY CAWLFIELD ('81 Civ. Eng.) chairs the Department of Geosciences and Geological and Petroleum Engineering at Missouri University of Science and Technology. **JENNIFER SEHLIN** ('81 Poli. Sci.) joined the real estate and land use group of Seattle-based law firm Helsell Fetterman. **AMY RUFF** ('82 Nursing) received the first Distinguished Service Award from Walla Walla Public Schools for her efforts during the COVID-19 pandemic. The award is the highest honor the district can give an employee. Ruff has served as director of Walla Walla Public Schools Health Services since 2017. She also served in the Air Force Nurse Corps for 22 years, achieving the rank of lieutenant colonel. **MARK WARMAN** ('84 Crim. Jus.) has joined the Tulsa, Oklahoma, law firm of Levinson, Smith and Huffman. **MIKE WALKER** ('85 Phys. Ed., '97 MEd Higher Ed. Admin.) is a 2021 Canadian Football Hall of Fame inductee. Walker was a defensive lineman who led the Cougs in sacks in 1981 and played in the Holiday Bowl that same season, which ended a 50-year streak of no bowl games. He played in the Canadian Football League for 10 years, appearing in four Grey Cups

and leading the Hamilton Tiger-Cats to the 1986 championship with 21 sacks. Walker is number 14 on the CFL all-time leaderboard with 95.5 sacks. Walker was also a WSU defensive line coach from 1997-2007. **VERNE WINDHAM** ('85 MA Music) retired from Spokane Public Radio after 38 years. Windham is a musician, conductor, radio announcer, and teacher. He is known for his lectures on music and has served as a visiting lecturer at WSU, Whitworth University, and Spokane Falls Community College. **RENA CARLSON** ('86 DVM) is the 2022-23 American Veterinary Medical Association president-elect. **JIM MEEHAN** (x'86) is the National Sports Media Association's Sportswriter of the Year for the state of Washington. He won the same distinction five times for the state of Idaho while working for the Spokane *Spokesman-Review's* North Idaho office. Meehan joined the *S-R's* staff in 1990 after working as sports editor for the *Moscow-Pullman Daily News*, and has covered Gonzaga basketball since 2007. **MIKE BENOIT** ('87 Ed.) is principal of Peninsula High School in Gig Harbor. **TARIQ AKMAL** ('88 English, '96 MA Ed., '97 PhD Ed.) is

CLASSnotes

JESSICA CLUTTER was among the first Peace Corps volunteers to return to overseas service since the agency's unprecedented global evacuation at the onset of the COVID-19 pandemic.

Clutter, of Spokane, recently returned to Costa Rica, where she had been studying as a Washington State University student when the pandemic hit. "I really want to travel and improve my Spanish," said Clutter, who was slated to work in Peace Corps' youth-in-development sector. "I'm mostly looking forward to meeting people and learning about their lifestyle. I'll be living with a host family so I'll be more involved in the culture and community."

Clutter ('21 Spanish) completed Peace Corps Prep at WSU. The program combines course work, hands-on experience, and leadership and intercultural skills with the aim of earning WSU's Global Leadership Certificate and creating strong Peace Corps applicants.



COURTESY JESSICA CLUTTER

After her service ends in fall 2024, she plans to pursue a master's in education and teach high school Spanish.

Peace Corps evacuated nearly 7,000 volunteers from more than 60 countries in March 2020. Current cohorts are made up of both new volunteers, like Clutter, and volunteers who were evacuated in 2020. All are engaging in pandemic response and recovery as well as work in Peace Corps' six sectors: agriculture, community economic development, education, environment, health, and youth in development.

By summer 2022, Peace Corps volunteers had returned to 19 countries, and the agency was recruiting volunteers to serve in 42 countries in all. More than 240,000 Americans have served in 142 countries worldwide since President John F. Kennedy established Peace Corps in 1961, including nearly 1,000 from Washington State University.

BY ADRIANA JANOVICH

WSU's 2022 Outstanding Department Chair. Akmal is an associate professor of curriculum and instruction in the College of Education and has been the chair of the Teaching and Learning Department since 2016. ✨ **BRIAN HATFIELD** ('89 Poli. Sci.) is legislative director for Secretary of State Steve Hobbs. A former state representative (1994-2004) and state senator (2006-2015), Hatfield served as the governor's Forest Products Sector lead at the Department of Commerce for the past six years before accepting his new post at the Capitol.

Bureau Federation's Partners in Advocacy Leadership program, and owner and operator of a milk-quality laboratory. She provides veterinary services for an Idaho dairy farm with 20,000 cows in six locations and three heifer ranches.

Aquatic Network, and Women in Environment.

10 CARLY CLEMENT ('10 Hosp. Busi. Mgmt.) is general manager at the Outrigger Waikiki Beach Resort. ✨ **LIZ WALKER** ('10 Psych., '12 Couns.) joined the Samaritan Healthcare behavioral health team. ✨ **KIRSTEN DYCK** ('12 PhD Amer. Stu.) received an English language fellowship from the US Department of State for the 2022-2023 academic year. Dyck will train teachers and teach English for 10 months in the Philippines. Previously, Dyck taught English through the Peace Corps in Ukraine. ✨ **LORI HUNT** ('13 MEd, '19 PhD Ed.) is the provost for Community Colleges of Spokane. ✨ **FELICIA OLMETA-SCHULT** ('18 PhD Env. Sci. & Nat. Res. Sci.) is the new coastal hazards specialist with Oregon Sea Grant and the Oregon State University Extension Service. Previously, she was an Oregon Sea Grant-funded Resilience Fellow. Olmeta-Schult hosts *Rising Sea Voices*, a podcast on the American Shoreline Podcast Network. She is a member of the Association for Women in Science, Women's

20 ARYAN DESHWAL ('20 MS Comp. Sci.) and **EMMA HEIN** ('22 Civ. Eng.) were recognized as outstanding research assistants by the Voiland College of Engineering and Architecture. ✨ **JACK DIVELBISS** ('21 Const. Eng.) is an engineer with Ahtna Global, a construction company based in Anchorage, Alaska. ✨ The Seattle Seahawks selected **ABRAHAM LUCAS** ('21 History) in the third round of the NFL draft. Lucas, from Everett, was the starting right tackle for the Cougs during his redshirt season in 2017 and remained in that position for five seasons before entering the 2022 draft. He was named second team All-Pac-12 Conference three years in a row. ✨ **INDIA DYKES** ('22 Bio. Eng.) is a recipient of the Fulbright US Student award. She will join the Tri-Ankle Project at the Fraunhofer IGB Institution, a partnership with the University of Stuttgart in Stuttgart, Germany. ✨ The Kansas City Chiefs selected **JAYLEN WATSON** ('22) in the seventh round of the NFL draft. Watson, from Augusta, Georgia, transferred to WSU and was a starting cornerback for the Cougs in 2020. He received an All-Pac-12 Conference honorable mention for the 2020 season and again in his final season at WSU.

90 ROGER NYHUS ('90 Comm.) sold Nyhus Communications to the strategic communications and marketing firm DH. The agency now has offices in Spokane and Seattle with more than 50 employees. ✨ **RACHEL DRAKE** ('94 Comm.) is vice president of human resources in Washington for Comcast. ✨ **JACQUELYN HIGH-EDWARD** ('96 MA Crim. Jus.) is a Spokane County Superior Court judge. ✨ **ALGERIAN HART** ('97 MA Rec. & Leisure Stu., '04 PhD Higher Ed. Adm.) is interim chief diversity officer and assistant to the president at Missouri State University.

00 ELIZABETH QUESNELL KOHTZ ('04 DVM) is a graduate of the American Farm

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IN memoriam

40 JOHN S. BUCKINGHAM ('47 Phys. Sci.), 97, November 20, 2021, Kennewick. SYLVIA RUTH BUSHAW ('47 Phys. Sci.), 96, July 22, 2022, Portland, Oregon. RICHARD S. CALDECOTT ('48 MS, '51 PhD Agro.), 96, May 29, 2020, Stillwater, Minnesota. HELEN C. CLARKSON ('49 MS Socio.), 96, July 16, 2022, Freeport, Maine. ELIZABETH L. SHEA ('49 Home Econ.), 94, July 22, 2022, Tacoma.

50 STANLEY W. HARRIS ('50, '52 MS Wildlife Biol.), 91, December 27, 2019, Lacey. RALPH M. JACKSON ('50 Civ. Eng.), 97, May 31, 2022, Mount Vernon. DONALD "HOBIE" HOBART BOND ('51 Econ.), 92, October 1, 2021, Bellevue. JACK WALLACE BURT ('51 Chem.), 92, September 4, 2021, Spokane. BURGESS G. LANGE ('51 Ag.), 93, November 30, 2021, Garfield. CHARLES R. NESS ('51 Ag. Eng.), 92, January 13, 2020, Port Orchard. RICHARD L. ZELLMER ('51 Vet. Sci., '56 DVM), 89, April 21, 2018, Davenport. VERNON PROFF ('52 Ag.), 91, April 19, 2022, Boise, Idaho. DORIS SMITH BARKER ('53 Elem. Ed.), 92, August 5, 2022, Des Moines. THOMAS W. BARKER ('53 Elec. Eng.), 88, February 23, 2020, Des Moines. PETE RADEMACHER ('53 Ani. Sci.), 91, June 4, 2020, Sandusky, Ohio.

Pete Rademacher was a Cougar football lineman in 1950 and 1951, a 1956 Olympic heavyweight boxing gold medalist, and a professional boxer. He was inducted into the State of Washington Sports Hall of Fame in 2022.

WILLARD M. BERRY ('54 Ag.), 89, April 8, 2022, Couer d'Alene, Idaho. DUANE P. LANCHESTER ('54 Comm.), July 11, 2022, Quincy, Illinois. DALE W. MASSIE ('54 Agro.), 90, August 3, 2022, Indian Wells, California. LEIF O. WIKAN ('54 Hotel & Rest. Admin.), 91, August 8, 2022, Bellevue. DAVID EUGENE EDWARDS ('56 Ag. Eng.), 87, December 19, 2018, Baker

City, Oregon. MARVIN CLINTON HIX ('56 Ag. Eng.), 96, March 16, 2022, Eau Claire, Wisconsin. MARIANNA MERRITT MATTESON ('56 MA For. Lang. & Lit.), 90, July 20, 2022, Pullman. MIKE AUER ('57 Pharm., Phi Sigma Kappa), 87, May 1, 2022, Lewiston, Idaho. KENNETH MURLIN BLACK ('57 Math.), 89, August 6, 2022, Cary, North Carolina. REX L. HENINGER ('57 Comm.), 88, September 28, 2019, Spokane. LAURA RUTH LUNDGAARD ('57 Lib. Arts), 86, October 2, 2021, Lacey. LEONA GAIL ZANDER ('57 Phys. Ed.), 86, July 25, 2022, Bellingham. GARY A. BURGINYON ('58 Physics), 85, February 24, 2021, Pleasanton, California. JOY ELAINE (HOLDIMAN) HURLBERT ('58 Bacterio.), 85, October 25, 2021, Olympia. GLORIA G. MOORE ('58 Phys. Ed.), 86, July 28, 2022, Bellingham. JANILY N. PATRICK ('58 Elem. Ed., '73 MEd, Kappa Kappa Gamma), 84, June 8, 2022, Spokane. CATHERINE LOUISE (MONROE) PROTEAU ('58 Gen. Stu., Kappa Alpha Theta), 85, April 28, 2022, Bremerton. JAMES E. WILLIAMS ('58 DVM), 90, June 8, 2022, Heber, Utah. RICHARD A. JANSSEN ('59 Busi.), 84, July 2, 2022, Spokane Valley. KAREN ANN SEGAL ('59 Bacterio., Kappa Delta), 84, July 15, 2022, Sequim. DONALD DANIEL TAYLOR ('59 Chem. Eng.), 90, August 9, 2022, Idaho Falls, Idaho.

60 CONNIE BADER ('60, '63 MAT Home Econ.), 84, July 26, 2022, Kennewick. FLORENCE ROSE KRALL SHEPHARD ('60 MAT Biol.), 95, July 26, 2022, Salt Lake City, Utah. RAYMOND G. JOHNSTON ('61 DVM), 90, September 2, 2022, Novato, California. VAN YOUNGQUIST ('61 Ani. Sci.), 84, August 23, 2022, Mount Vernon. ROBERT Z. DEFFENBAUGH ('62 Busi.), 92, July 21, 2022, Hermiston, Oregon. ROBERT L. HARTMEIER ('62 Agro.), 87, July 16, 2022, Salinas, California. ANN L. MARSH ('62 Fine Arts), 82, June 18, 2022, Clarkston. DWIGHT PAXTON ('62 Busi.), 82, September 30, 2017, Lake Havasu,

Arizona. RHEA PAULINE SHEFFIELD ('62 Bacterio.), 81, July 18, 2022, Port Angeles. PAUL R. ANTSEN ('63 Poli. Sci., Phi Kappa Alpha), 80, June 2, 2022, Wilmington, North Carolina. CAROL ANN CARLON ('63 Elem. Ed., Kappa Kappa Gamma), 80, March 30, 2022, Denver, Colorado. KAY FRANCES (HONSINGER) DIRKS ('64 Ed.), 80, July 25, 2022, Quincy. PATRICIA WYLAM MORGAN ('65 Elem. Ed.), 78, July 25, 2022, Port Angeles. GEORGE JOSEPH BUTLER ('66 MS Civ. Eng.), 90, March 18, 2022, Mesquite, Nevada. NEIL WARREN CLAYTON ('66, '68 MA Socio.), 78, January 30, 2022, Sequim. ROBERT RAY DAVIS ('66 Ag.), 78, October 15, 2021, Zillah. CHAIM FRENKEL ('66 PhD Hort.), 88, August 12, 2022, New Brunswick, New Jersey. KAREN IRENE LEWIS ('66 Elem. Ed.), 79, June 1, 2022, Rockford. SHERRILL SENN MOZEY ('67 Home Econ.), 77, August 17, 2022, Eden Prairie, Minnesota. STEVEN GUY PEPPARD ('67 Comm.), 80, August 2, 2022, Bonita Springs, Florida. NEIL ALVIN FELGENHAUER ('68 Comm.), 76, March 6, 2022, Spokane. JAMES MICHAEL GIUFFRE ('68 Hotel & Rest. Admin.), 71, March 9, 2017, Bothell. OWEN V. JOHNSON ('68 History), 76, August 6, 2022, Bloomington, Indiana. CARL FLAGSTAD MOORE ('68 MAT Math.), 87, January 28, 2022, Yakima. LOUISE SANDRA REUBLE ('68 Home Econ.), 76, July 28, 2022, Oak Harbor. ROBERT J. STEINBURG ('68 Busi.), 75, November 16, 2021, Wenatchee. CHERYL RUTH WILLIAMS ('68 Socio.), 76, July 30, 2021, Winlock. ROBERT W. SCHWARTZ ('69 Mat. Sci.), 74, April 7, 2022, University Place. JOHN M. TURNBOW ('69 Zool.), 73, January 21, 2022, Lubbock, Texas. TIMOTHY J. YALE ('69 Pharm.), 76, June 17, 2022, Sacramento, California.

70 JOHN E. CANNON ('70 Econ., '75 DVM, '79 MS Microbiol.), 76, August 17, 2022, Spokane. KENNETH EUGENE ELDER ('70 Psych., Delta Tau Delta), 73, July 14, 2021,

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In Memoriam

Oklahoma City, Oklahoma. **JOSEPH H. FOSTER** ('70, '73 MS Wildlife Biol.), 81, December 21, 2021, Olympia. **VERNE H. MCCLURG** ('70 MS Police Sci.), 83, September 16, 2019, Dothan, Alabama. **CYNTHIA MARIE CHASE-SPILMAN** ('71 Elem. Ed., '79 MEd, Gamma Phi Beta), 73, March 25, 2022, Richland. **ROBERT JOHN WEIMER** ('71 MS Plant Path.), 76, July 20, 2022, Atwater, California. **PETER G. DOUMIT** ('72 History, Ed.), 69, November 10, 2018, Moses Lake. **MICHAEL GLEN ELLIS** ('72 Soc. Sci.), 72, July 30, 2022, Issaquah. **KENNETH ALAN GOODWIN** ('72 Bacterio.), 75, July 4, 2022, Walla Walla. **JERRY ARTHUR HANOWELL** ('72 Elem. Ed.), 79, May 27, 2022, McMinnville, Oregon. **EDMUND A. MACHTMES JR.** ('72 Agro.), 78, March 25, 2021, Spokane. **DARYL PREUNINGER** ('73 MEd), 81, March 11, 2022, Camas. **RICHARD ALLEN WAYENBERG** ('73 Comm., '84 MS Phys. Ed.), 71, July 27, 2022, Pullman. **JOHN HALL ANTICH** ('74 Pharm.), 70, July 2, 2022, Spokane Valley. **CARL HOWARD HARMON** ('74 Phys. Sci.), 74, June 2, 2017, Quartzsite, Arizona. **PAMELA A. FOGLEMAN HESELGRAVE** ('74 Gen. Stu.), 70, August 25, 2022, Bellevue. **BARBARA K. BAIR** ('75 Ed.), 70, June 7, 2021, Vancouver. **CLIFF HENNING** ('75 Ag.), 73, January 3, 2022, Stanwood. **HUGH IMHOF** ('75 Comm.), 74, July 2, 2022, Spokane. **LINDA K. CARLISLE** ('76 Poli. Sci.), 68, April 7, 2022, Boston, Massachusetts. **MAUREEN BRIDGET RILEY** ('76 Nursing), 67, February 10, 2022, Tempe, Arizona. **DOUGLAS TY WHITENER** ('76 Wildlife Biol.), 68, July 30, 2022, Yakima. **DOUGLAS RALPH**

BENNETT ('78 Pharm.), 71, July 3, 2022, Cedar Hills, Utah. **JAMES WHITNEY** ('78 Const. Mgmt.), 63, January 12, 2019, Medina. **JAMES E. DESHIRLEY** ('79 Elec. Eng.), 74, June 22, 2022, Vancouver. **DENNIS C. MCBRIDE** ('79 PhD Socio.), 77, August 10, 2022, Steilacoom. **S. KARL MOLDREM JR.** ('79 Hotel & Rest. Admin.), 65, July 15, 2022, Davenport.

80 **CATHERINE A. GITKOV** ('80 Wildlife Biol., '81 MS Biol.), 74, July 17, 2022, Juneau, Alaska. **JANET LOUISE MERRILL HOSSACK** ('80 PhD Psych.), 93, May 29, 2022, Sandpoint, Idaho. **SCOTT W. WENDLING** ('82 DVM), 66, June 24, 2022, Herriman, Utah. **JOYCE MARIE KLAKKEN** ('83 PhD Couns. Psych.), 86, June 19, 2022, Spokane. **JERRY A. NEIDIGER** ('83 Gen. Stu.), 74, May 16, 2022, Milwaukie, Oregon. **SANDY WILLIAMS** ('83 Psych), 60, September 5, 2022, Spokane.

Spokane community and civil right activist **Sandy Williams** died in a Puget Sound floatplane crash on September 5. Williams started *The Black Lens* in 2015 as editor and publisher. Williams also founded the Carl Maxey Center, which opened this year to promote economic development, education, and cultural enrichment in Spokane's Black community.

ROBERT BRUCE STEELE ('88 Hotel & Rest. Admin.), 59, June 28, 2022, Roseville, California.

90 **RICHARD R. JORDAL** ('95 MEM Eng. Mgmt), 59, August 27, 2020, Seattle. **BRETT LELAND TILLER** ('96 MS Env.

Sci.), 54, June 19, 2022, Richland. **ROBERT WAYNE ARMSTRONG** ('97 Soc. Sci., '99 MEd Couns.), 68, January 17, 2022, West Richland. **RONALD EDWARD KINION** ('98 Comp. Sci.), 48, July 24, 2022, Auburn.

JEFFERY MICHAEL CROUCH ('00 Elec. Eng.), 47, November 18, 2021, Pasco. **CHAD ALYNBODNAR** ('03 Hum.), 44, July 18, 2022, Richland. **MONIQUE GARCIA** ('05 Nursing), 41, July 12, 2022, Kennewick.

FACULTY AND STAFF

DARRELL BARSTOW, 83, WSU Puyallup, 1967-1994, June 15, 2022, Puyallup. ✨ **DIANE BERGER**, 77, Political Science, 1995-2006, May 11, 2022, Spokane. ✨ **ROBERT DUPEA**, 86, Facilities Services, 1989-2002, August 15, 2022, Lewiston, Idaho. ✨ **ANN MARSH**, 82, Human Resource Services, 1976-1990, June 18, 2022, Clarkston. ✨ **THOMAS G. PESEK**, 83, History, 1966-1999, June 25, 2022, Omaha, Nebraska. ✨ **CLARENCE JAMES PETERSON JR.**, 93, Crop & Soil Sciences, 1988-1994, July 28, 2022, Pullman. ✨ **DOUGLAS POWELL**, 68, Facilities Services, 1992-2018, June 6, 2022, Pullman. ✨ **THOMAS PETER RUFF**, 86, Education, 1968-2001, July 27, 2022, Seattle. ✨ **MELVINA "PINKY" TUTTLE**, 83, Information Services, 1980-2004, August 27, 2022, Colfax. ✨ **DOREEN JEAN TWO**, 88, Housing, 1979-1995, July 26, 2022, Pullman. ✨ **RALPH F. WEBB**, 66, Facilities Services, 1988-2020, July 21, 2022, Palouse.

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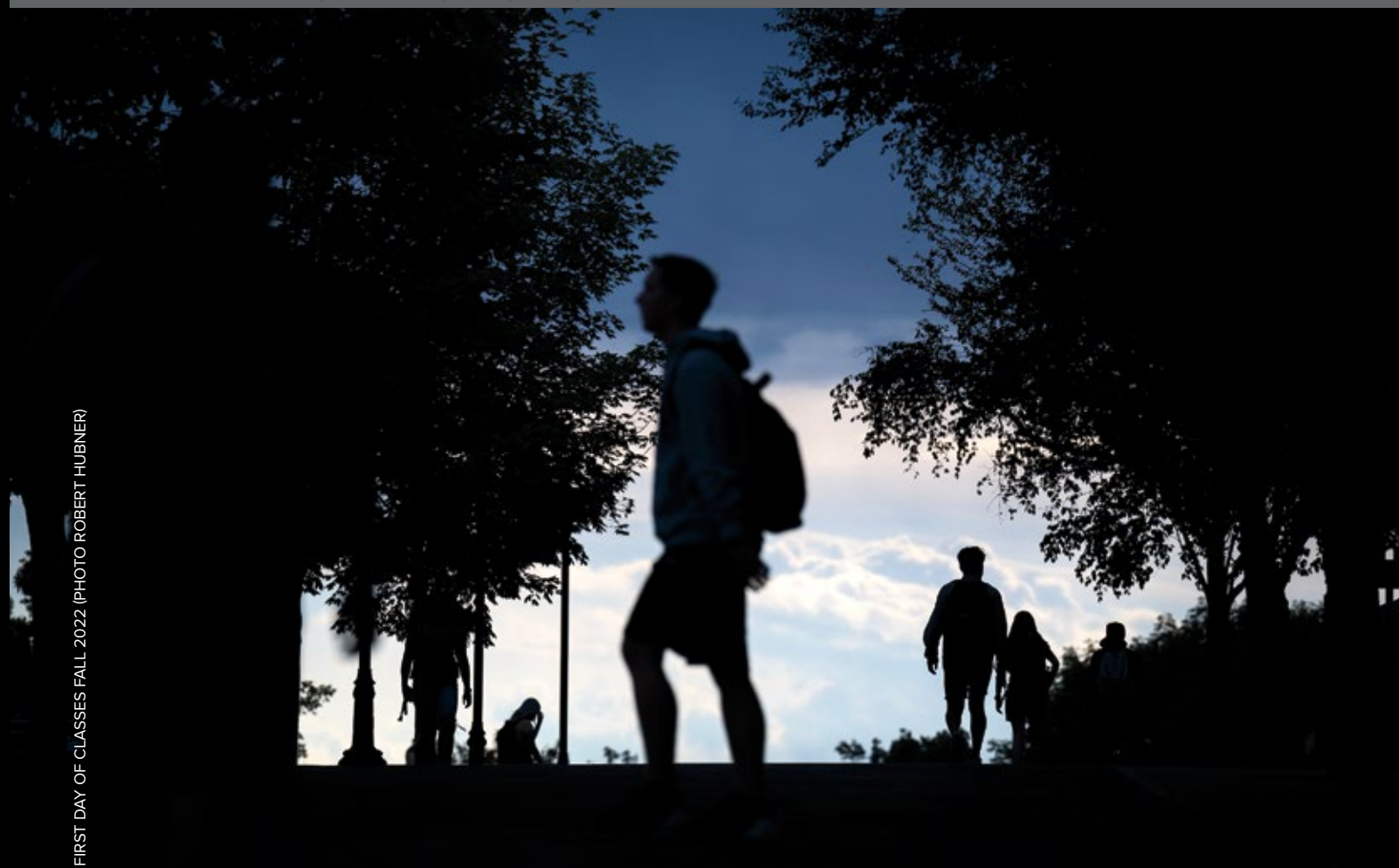
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LAST words

BY LARRY CLARK



FIRST DAY OF CLASSES FALL 2022 (PHOTO ROBERT HUBNER)

Simply getting back ...

When students and faculty return to Washington State University campuses after the summer, there is a simple joy in embarking on the new year, meeting friends and colleagues, and joining together in events that bring the university alive. This fall, in particular, has a special feeling as the COVID-19 pandemic eases and Cougs return to classrooms, labs, gyms, and dining halls.

"For the first time since 2019, we are starting fall classes without any restrictions on our campuses," WSU President Kirk Schulz wrote to the university community at the beginning of the academic year. "It's an exciting return to normalcy, and the beginning of a new chapter for WSU."

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Coming from a family of WSU grads, he knows and embraces WSU's family culture. A high-achieving student, he received a generous scholarship package, a promise of access to undergraduate research opportunities, and opportunities to join student clubs and projects—all supported by WSU's passionate donor base.

An outdoors enthusiast, John combined his personal passion for conservation with his studies in materials science to pursue solutions to make nuclear waste storage safer and more effective.

John was recently selected as a 2022 Barry M. Goldwater Scholar—a prestigious award given to just 417 students nationwide. His journey is just beginning. We are proud to see what John will achieve, and we are thankful for the 40,000+ donors who played a supporting role for students like him.



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Donor support is a catalyst for much of the success students have here.

— John Bussey
 OLYMPIA, WA | 2022 GOLDWATER SCHOLAR



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Ideas for fungus; actor
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