WINTER 2015-16

THE MAGAZINE OF THE UNIVERSITY OF UTAH

CONTINUUM

WHEN BRIGHT MINDS TURN DARK

With mental health concerns among college students on the rise, the U is throwing a lifeline.

FROM REFUGEE TO ROBOTICS PROF :: RED HOT AT TICKLING THE IVORIES :: UNEARTHING A NEW HUMAN ANCESTOR

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WINTER 2015-16
VOL. 25 NO. 3

DEPARTMENTS

(Cover photo by Randy Collier)

The Revson Fountain at New York's Lincoln Center was designed by Mark Fuller's Company WET.

> *[The Curie Poster] is an innovative way to recognize a Nobel Prize-winner. Her legacy remains well in Poland today, and your artwork is a testimony of the good things that come out of the U."*

FLOWING IMPACT

This was a very intriguing article ("A Big Splash," Fall 2015). I have marveled at many of these water features without knowing their connection to my alma-mater. Thanks for the story!

Frank Heiser BS'55
Cedar City, Utah

Great story! I can't thank the U enough for the great education I received. My master of public administration degree led to my current position as registrar of voters for Marin County, California.

Lynda Roberts
BFA'98 MPA'05
Sausalito, California

MADAME CURIE

Love this poster! ("The Curie Poster," Fall 2015) It's great to see U women recognized for following in Marie Curie's footsteps. Admirers of Marie Curie may like to look at the Marriott Library's first edition of *Traite de Radioactivite*, Paris, 1910 (QC721 C98 1910), held in the Rare Books collection. *Traite* is Curie's fullest statement on radioactivity, a word she created for a concept that she invented and defined. One year after the publication of *Traite*, she became the first scientist to be awarded a second Nobel Prize, for the isolation of the elements radium and polonium.

Luise Poulton BA'01
Rare Books Manager,
Marriott Library
Salt Lake City

I wish to congratulate Tomi Carr, Dave Titensor, and Marla Kennedy as well as [the *Continuum* editors] for the impressive "Curie Poster"! It is an innovative way to recognize a Nobel Prize-winner. Her legacy remains well in Poland today, and your artwork is a testimony of the good things that come out of the U. Thanks for printing it, and for its impact on those of us with Polish heritage.

Ernie Witucki BS'64
Lakewood, Colorado

HIGHS AND LOWS

Bill was a great guy ("A Book for Life," Spring 2014). He was a gentle and kind man who could play the drums almost as good as basketball. I dated him in '61 and '62, until racial prejudice got so bad for us that Coach Gardner told him we had to stop seeing each other. [Billy McGill was black, while Nelson is white.] Bad PR, I suppose. Still, I thought the world of him, and he was lots of fun.

Sharon Nelson
Salt Lake City

We're eager to hear from you! Please go to continuum.utah.edu/contact-us/ *for our contact information.*

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Gerawork Teferra

REFUGEE CAMP STUDENTS GRADUATE FROM NEW SOCIAL WORK PROGRAM

Gerawork Teferra fled to Kakuma, Kenya, from his native Ethiopia with nothing but desperation.

At a camp in Kakuma, the young man joined thousands of refugees from neighboring African nations, most of whom had traveled hundreds of miles to reach the safety of a refugee camp far from violence, religious persecution, and starvation in the places they'd once called home.

For Teferra, the experience of arriving at the camp was jarring. He met hundreds of people who shared stories unimaginable to most: young children who watched their families being killed and barely survived war erupting around them; survivors of sexual assault; people who'd been forced into labor by factions ruling their home countries.

As Teferra came to terms with his own situation, he took an opportunity to become a secondary teacher and also enrolled in a new online program, developed by the University of Utah College of Social Work, designed to train individuals living and working in refugee camps to provide care and services to other camp residents. In mid-October, Teferra became one of the first cohort of 12 graduates from the U's new Case Management Certificate program. All lived in camp communities to receive their training and came into the social work program after already living in camps for years.

"As social workers, we have the duty to prepare students to better understand the global condition, and be well equipped with knowledge, skills, and tools that recognize and acknowledge the uniqueness and similarities of migrants and refugees' experiences and demands," says Rosey Hunter, an associate professor in the College of Social Work who oversees the new certificate program. "The unsettled global context requires that social work education develops innovative programs that will adequately prepare students to practice across diverse communities and complex sociopolitical settings."

U UNVEILS BROAD NEW STUDENT SUCCESS INITIATIVE

The U has a new five-year, $200 million Student Success Initiative to support projects in three areas of focus: scholarships and fellowships; living and learning communities; and transformative learning experiences.

Among the supported activities are the MUSE Project (My U Signature Experience), LEAP (Learning, Engagement, Achievement, and Progress), Student Success Advocates, Diversity Scholars, national and international internships, and service learning. Each of the programs provides students with deeply engaged, hands-on, experiential learning and community involvement opportunities.

For example, LEAP encourages the formation of a learning community by offering classes where the same students and professors remain together through multiple semesters. Another supported program, Capstone Initiatives, helps students design a one- or two-semester-long project in which they apply the knowledge and skills accumulated through their undergraduate careers to a project with a real-world application.

Other goals the university hopes to achieve as part of the initiative are enabling more students to learn and live on campus; replacing Orson Spencer Hall with a new learning center (with a student welcome center within it); creating more interdisciplinary science labs; and creating a new home for the theater, film, and media arts programs.

RENOVATED **KENNECOTT BUILDING:** PART OF BUILDING A BETTER U

The newly renovated Rio Tinto Kennecott Mechanical Engineering Building is not just bigger and newer, it's also much safer, and more energy efficient—one of the latest examples of the U's efforts to build one of the most sustainable campuses in the country.

What began as a 54,000-square-foot building built in the 1950s for Kennecott Utah Copper Corp.'s research offices has become a 76,000-square-foot space with the latest in energy-saving technology and safety features. All told, the building will use nearly 53 percent less energy than a standard compliant building, and it is expected to receive a LEED Gold certification from the U.S. Green Building Council.

The building's four-year, $24 million renovation was completed in October 2015, and the new home for the U's mechanical engineering department now has nearly 60 offices, 11 student study areas, five conference rooms, and 12 research labs. The project was completed using all non-state and private funds, including a lead gift from Rio Tinto Kennecott.

U LAUNCHES NEW **KEM GARDNER** INSTITUTE

The University of Utah has announced the new Kem C. Gardner Policy Institute, an initiative of the David Eccles School of Business. The institute aims to support informed decision-making by developing and sharing economic, demographic, and public policy research. In addition, the institute serves as a prestigious gathering place for thought leadership.

Named in honor of businessman, philanthropist, and U alum Kem Gardner BA'67 JD'70, the institute builds upon his legacy of hard work and his great love for Utah. Gardner currently serves as chairman of The Gardner Company, a private commercial real estate company. During his 38 years in business, Gardner and his partners have been involved in developing more than 33 million square feet of commercial real estate.

"There are a lot of needs around us, and Utah has big decisions ahead," Gardner says. "I love this state and want to make a difference. I look at the policy institute and know it will help our community and business leaders make better-informed decisions."

Marjorie Chan

WATER ON **MARS**

While scientists previously identified ice on Mars, NASA in late September announced evidence of salty water flowing intermittently on the Red Planet. U geology and geophysics professor Marjorie Chan for years has studied landscapes and geological records on Earth that serve as analogs for those on Mars. More than a decade ago, she studied rocks in southern Utah known as Moqui marbles—round "concretions" that form underground when minerals precipitate from flowing groundwater. She predicted similar rocks would be found on Mars. And NASA's Opportunity rover indeed found such rocks, which were nicknamed "Martian blueberries." In the past six years, Chan has led Mars researchers on field trips to Utah sites that may help them understand similar sediments on Mars. With growing evidence of past and present water on Mars, Chan believes the possibility is higher than ever that microbial life may exist today on Mars or be preserved in soils there.

U EXPANDS INITIATIVE TO HELP **WOMEN STUDENTS SUCCEED**

The Women's Enrollment Initiative has built new campus and community partnerships providing a network of support such as mentorships, grants, and internships for women students, and a new website (*women.utah.edu*) now helps them find the resources they need.

"Women face a unique set of challenges in their journey to achieve an education," says Debra Daniels MSW'84, director of the Women's Resource Center and assistant vice president for the initiative, begun in fall 2014. "Through the focus groups and research we conducted during the past year, we've gotten better insight into the specific issues that prevent women from graduating and what resources are needed to help them succeed."

The Women's Resource Center has now grown its annual scholarship offerings to more than $220,000. During the past 10 years, the U has found that women who receive these scholarships have an 88 percent graduation and retention rate. The center also offers emergency grants to help women who are facing financial emergencies—such as unexpected car trouble or unplanned day care expenses—as well as for educational expenses such as books, so women don't have to postpone school for a job. Among those who receive these emergency grants, there is an 83 percent retention rate.

"We understand the value of having a diverse campus, and women are an important part of that," says Daniels. "Everyone is part of this initiative, because we all benefit when women have college degrees. Education helps women grow personally and allows them to better care for themselves and their families, be better role models for their children, and improve our state, the nation, and the world."

TEMPORARY UMFA CLOSURE IN 2016, BUT MANY PROGRAMS CONTINUE

The Utah Museum of Fine Arts will close temporarily in 2016 for a major gallery reenvisioning, as well as to install state-of-the-art vapor barrier technology in the award-winning Marcia and John Price Museum Building. The changes will significantly enhance the visitor experience and extend the lifespan of the building, which protects the nearly 20,000 art objects stewarded for the university and the people of Utah.

The UMFA is holding a "Long Live Art!" party Jan. 16-17—with free admission both days—offering visitors everything from film to yoga, art-making to a big dance party, before closing for the first four to six months of 2016. After the first phase of construction, the museum's auditorium, café, and lobby are expected to reopen to the public. Anticipated reopening for the entire museum is spring 2017.

The popular Third Saturday for Families monthly program will continue during the closure, at UMFA or at locations elsewhere on campus. The extensive statewide outreach to K-12 educators and students through a variety of programs will also continue, as will programs for members. And on Feb. 25, the UMFA will launch a new series called "ARTLandish: Land art, Landscape, and the Environment," a yearlong initiative of lectures, films, panel discussions, tours, and other events investigating humans' complex relationship with the Earth.

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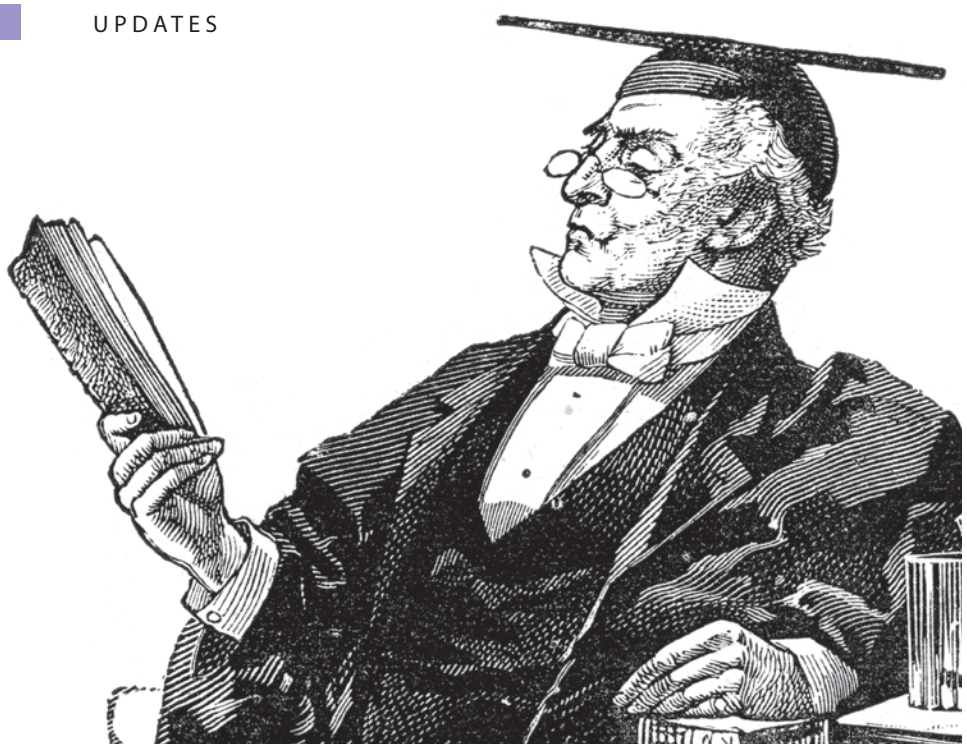

WHAT IS '**ACADEMIC FREEDOM**'?

By L. Jackson Newell

Great universities play a unique and vitally important role in American life, one that is often misunderstood and sometimes slammed by other institutions. In the Fall issue of *Continuum*, I told the story of the University of Utah's pivotal place in the history of academic freedom. Here, I explain the defining principles of academic freedom, on which universities like ours are anchored worldwide.

In the U.S., the "Statement of Principles on Academic Freedom and Tenure" was hammered out nearly a century ago by the American Association of University Professors (AAUP). Virtually every academic organization has endorsed it, and democratic nations invariably acknowledge the AAUP's belief that "institutions of higher education are conducted for the common good and… the common good depends upon the free search for truth."

The remarkable freedom that professors enjoy in teaching and research comes with a sobering set of responsibilities:

~ In research, professors may pursue truth or meaning wherever they may lead, regardless of whose ox may be gored, but they also have a duty to be perfectly honest regarding the sources of their information, about the reasoning they use to analyze what they find (their methods), and in reporting their conclusions—neither inflating nor distorting the facts, and avoiding unsubstantiated claims. Faculty in the creative arts—visual, performing, literary, and the like—are granted comparable rights and bound by similar responsibilities.

~ In teaching, professors may assign readings and conduct discussions as they deem necessary to give students a full understanding of the ideas or issues under study. While they may require students to know and understand controversial ideas, professors also have a solemn duty to respect each student's right to arrive at his or her own conclusions.

~ Like other citizens, professors enjoy the right to engage in public debate and express their opinions on any issue they wish. But they cannot claim that they speak for their university, nor can they use their academic title unless their point of view is informed specifically by their field of study.

Academic tenure—a career-long faculty appointment—exists to protect scholars and teachers from dismissal for exercising their freedoms. Tenure is not won easily. New professors serve a probationary period of up to seven years, during which they must prove their competence as scholars and teachers, and also demonstrate their acceptance of the ethical duties that attend their freedom. Only after senior colleagues are satisfied on both accounts, typically after three to five years, can an early-career professor be awarded tenure. Importantly, tenure does not protect a professor from dismissal for moral turpitude (such as committing a felony or having an improper relationship with a student) or if the university chooses to eliminate the department in which tenure was granted.

These are the *principles* and *practices* to which professors and their universities owe allegiance. Like members of other institutions, we sometimes fall short. When we do, we violate the public's trust and place our cherished freedom of inquiry at risk. I take satisfaction in the respect the faculty, students, and presidents of the University of Utah have shown for both the rights and the duties of academic freedom. This century-long legacy serves the peoples of Utah and the world with critically needed new ideas and independent thought. It is to be prized.

—L. Jackson Newell is a professor emeritus of educational leadership at the University of Utah who currently teaches in the Honors College.

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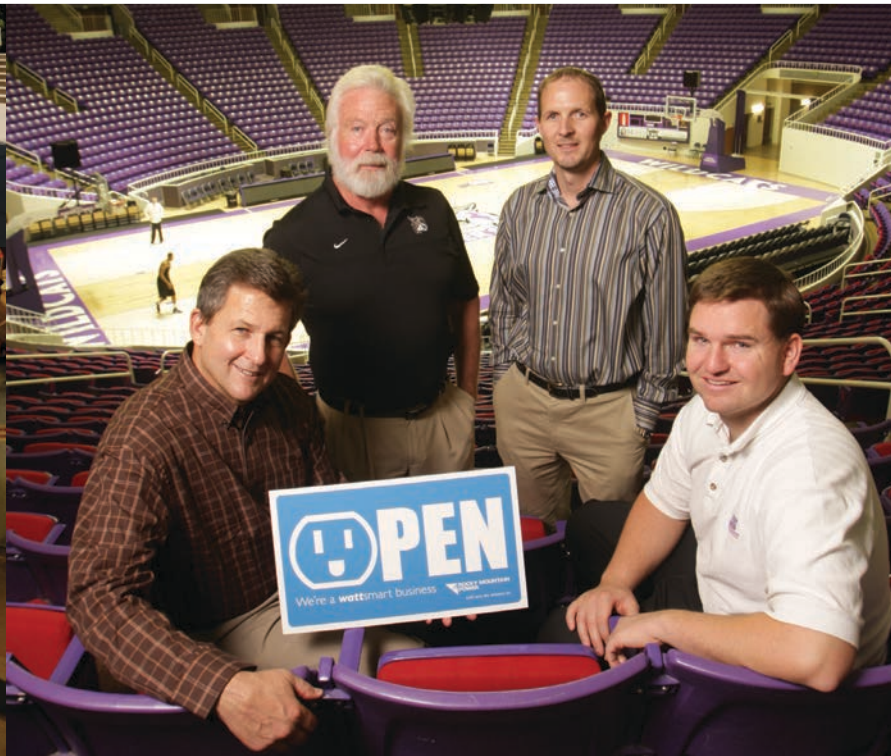


Piano Forte

The Ladies in Red, a performing group established through the University of Utah's Piano Department, travel across the U.S. to bring attention to the need for music education in early childhood and raise funds for the U's Piano Outreach Program, which offers piano classes teaching the fundamentals of music as part of after-school programs in elementary schools throughout Salt Lake City. Graduate teaching assistant (and current member of the Ladies) Desiree Gonzales notes: "Music has not only made me a more sensitive human being, but it has also taught me about patience, perseverance, and hard work. In short, it has made me a better person." The Ladies in Red are available to book for events. Email *susan.duehlmeier@music.utah.edu*.

From L to R: Kate Poulton, Ran Duan, Cassie Taylor, Lindsey Wright, Aiting Gao, and Desiree Gonzales

Visit continuum.utah.edu *to learn more about the Ladies in Red and view a photo gallery.*

CYBERATTACKS: THE NEXT WAVE

THE NEXT GENERATION
OF CYBERATTACKS WILL BE MORE SOPHISTICATED, MORE DIFFICULT TO DETECT, AND MORE CAPABLE OF WREAKING UNTOLD DAMAGE ON THE NATION'S COMPUTER SYSTEMS.

So the U.S. Department of Defense has given a $3 million grant to a team of computer scientists from the University of Utah and University of California, Irvine, to develop software that can hunt down a new kind of vulnerability that is nearly impossible to find with today's technology.

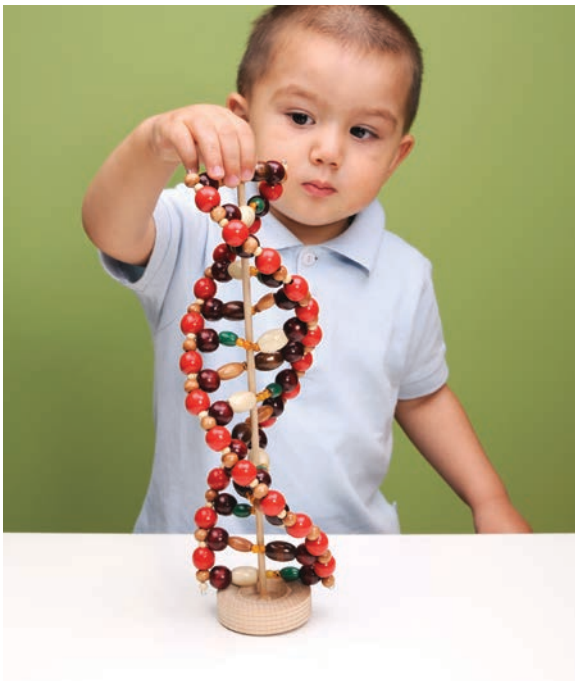
The team is tasked with creating an analyzer that can thwart so-called algorithmic attacks that target the set of rules or calculations that a computer must follow to solve a problem. Algorithmic attacks are so new and sophisticated that only hackers hired by

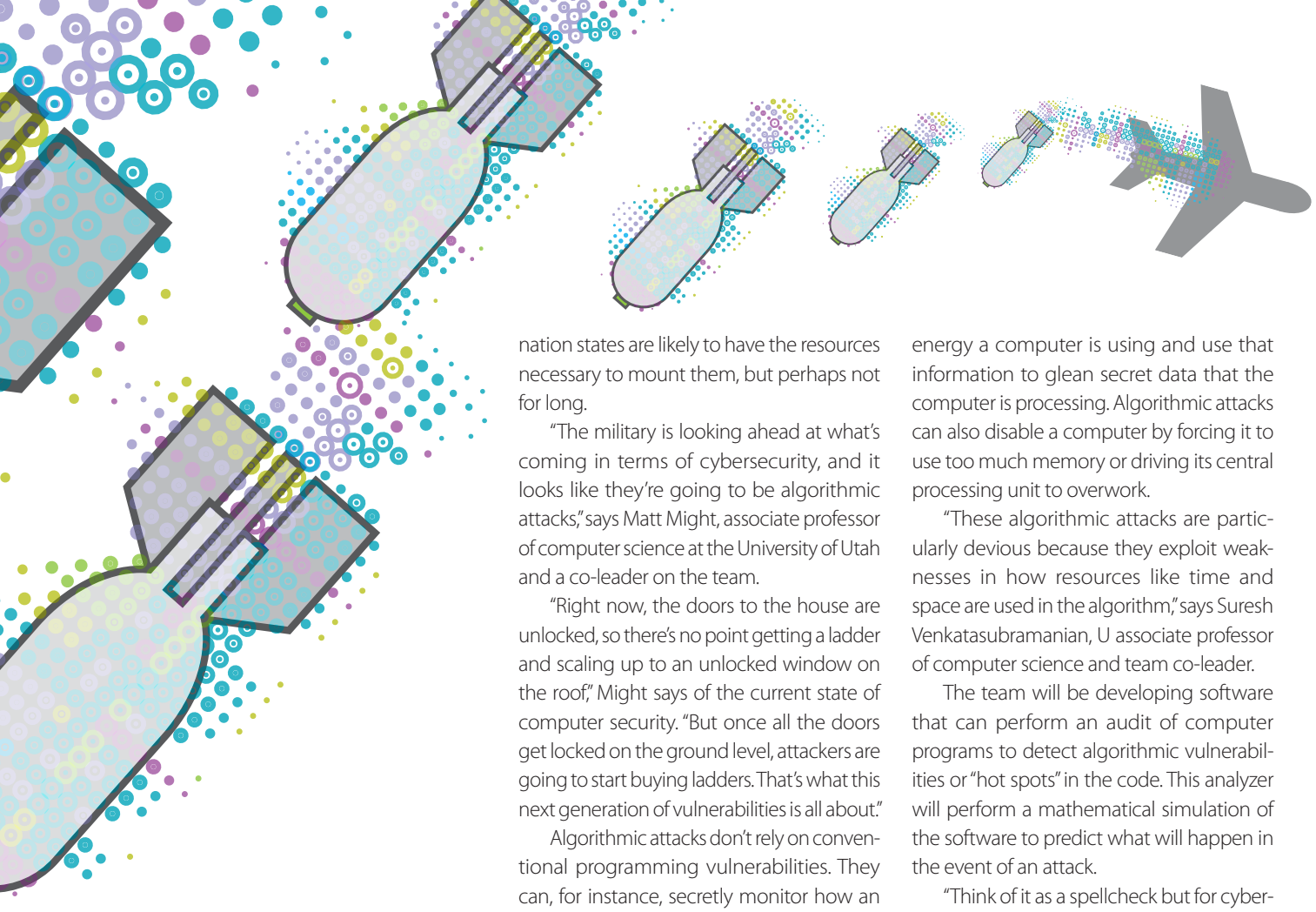
U PARTNERS WITH BRITAIN'S 100,000 GENOMES PROJECT

Genomics England (a company owned by the UK Department of Health) is using technology co-developed in a partnership between the University of Utah and Omicia to interpret the DNA of Britons as part of the 100,000 Genomes Project, a national effort to hasten creation of diagnostics and treatments that are tailored to a person's genetic makeup. Two core components of the Omicia Opal platform, which transforms genomic data into clinically relevant information, were developed by Mark Yandell, professor of human genetics at the University of Utah and co-director of the USTAR Center for Genetic Discovery: the Variant Annotation, Analysis and Search Tool (VAAST) and Phenotype Driven Variant Ontological Re-ranking tool (Phevor) algorithms.

Published in 2011, VAAST has become a benchmark in genome analysis and is already in use at more than 300 locations throughout the world. VAAST is best recognized for discovering a genetic variation that leads to Ogden syndrome, one of the first disease genes found through genome sequencing. A newer algorithm, Phevor, has been used in conjunction with VAAST to identify disease-causing genes found in a single patient or in a small family of two or three, the most common clinical situation for undiagnosed and rare diseases.

"What we want to be able to do is help the kid who is born with a hard-to-diagnose genetic disorder," says Yandell. "Our genome interpretation tools will be able to identify that disorder and guide treatment."





nation states are likely to have the resources necessary to mount them, but perhaps not for long.

"The military is looking ahead at what's coming in terms of cybersecurity, and it looks like they're going to be algorithmic attacks," says Matt Might, associate professor of computer science at the University of Utah and a co-leader on the team.

"Right now, the doors to the house are unlocked, so there's no point getting a ladder and scaling up to an unlocked window on the roof," Might says of the current state of computer security. "But once all the doors get locked on the ground level, attackers are going to start buying ladders. That's what this next generation of vulnerabilities is all about."

Algorithmic attacks don't rely on conventional programming vulnerabilities. They can, for instance, secretly monitor how an algorithm is running or track how much energy a computer is using and use that information to glean secret data that the computer is processing. Algorithmic attacks can also disable a computer by forcing it to use too much memory or driving its central processing unit to overwork.

"These algorithmic attacks are particularly devious because they exploit weaknesses in how resources like time and space are used in the algorithm," says Suresh Venkatasubramanian, U associate professor of computer science and team co-leader.

The team will be developing software that can perform an audit of computer programs to detect algorithmic vulnerabilities or "hot spots" in the code. This analyzer will perform a mathematical simulation of the software to predict what will happen in the event of an attack.

"Think of it as a spellcheck but for cybersecurity," Might says

MEANWHILE, A WARNING: GENETIC TESTING IN KIDS IS COMPLICATED

Today, there are more than 30 companies that offer direct to consumer (DTC) DNA testing, and it is now possible to sequence someone's entire genetic code for the price of a laptop. But acquiring genetic information is not without consequences, particularly when it comes to children. And the American Society of Human Genetics (ASHG) says that should give us pause.

The ASHG Workgroup on Pediatric Genetic and Genomic Testing has now issued guidelines for genetic testing in children and adolescents that are based on a thorough review of studies on ethical, legal, and social implications. The recommendations were published in *The American Journal of Human Genetics*.

Bioethicists agree that genetic testing in children is nearly always warranted when the results could have an immediate impact on health care decisions. For example, if searching for the cause of a serious illness, or if a child is at imminent risk for developing a disease such as childhood cancer.

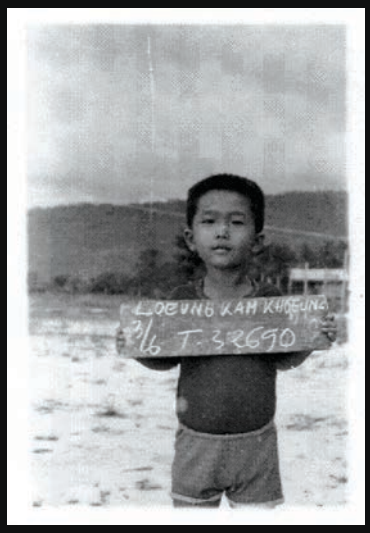
It is predictive testing—looking for genetic signs of health conditions that typically arise during adulthood—that is particularly fraught with complication. The vast majority of genetic tests don't outright predict someone's health future. Sometimes the disease never develops, even if it's against the odds.

"Physicians and bioethicists have been concerned that this powerfully predictive information could stigmatize the child," says bioethicist Jeffrey Botkin, chair of the workgroup and director of the Utah Center for Excellence in ELSI Research at the University of Utah School of Medicine. While parents might want only the best for their baby daughter, for example, he notes, "A genetic prediction might create a dark cloud that changes how the family and others think about the prospects of that young girl for [not only] health, but also for a career and marriage."

> *Acquiring genetic information has consequences."*

Based on considerations like these, ASHG recommends holding off on this type of predictive testing in children and letting them make decisions for themselves as adults.

MAN IN MOTION



A challenging childhood gave Kam Leang a drive toward ingenuity.

BY ELAINE JARVIK

Photo by Jeff Bagley

Here, Kam Leang with a drone in his robotics lab. At left, Leang at a refugee camp in Thailand in 1979.

Before we talk about flying robots, we need to talk about food.

It is 1977, and four-year-old Kam Leang is living with his family in southern Cambodia, forced out of the city and into the countryside by the Khmer Rouge. His father is often taken away to do something he doesn't want to talk about when he gets home. And there is never enough to eat.

His father fashions a mousetrap out of wire and wood, and every night he sets it. "I remember at two or three in the morning it going off," Leang says. "And my brother and I were so excited." This was not about rodent control.

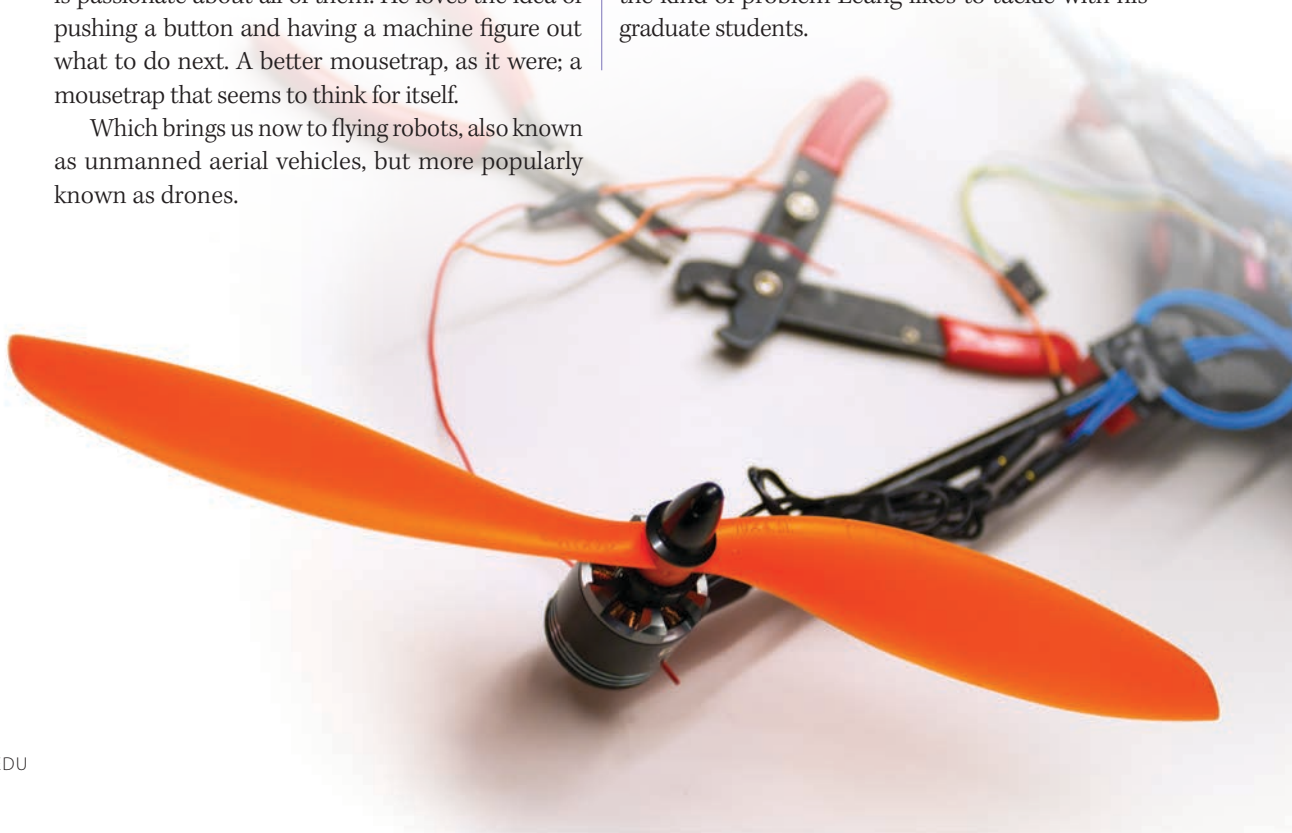
Leang wonders now, nearly four decades later, if his early years had a bearing on his later career. He offers this theory: Perhaps, he says, being hungry all the time created an insatiable drive to always want more. Not more food or more stuff, but more projects and challenges and ideas. More problems to solve.

Leang is now a professor of mechanical engineering at the University of Utah, and founder and director of the U's DARC Lab. The initials stand for design, automation, robotics, and control, and Leang is passionate about all of them. He loves the idea of pushing a button and having a machine figure out what to do next. A better mousetrap, as it were; a mousetrap that seems to think for itself.

Which brings us now to flying robots, also known as unmanned aerial vehicles, but more popularly known as drones.

Drones raise a host of ethical and existential questions (including "Does our species really need Amazon to deliver us a package in 30 minutes?"). But drones also pose huge safety concerns, including how to keep them from colliding with airplanes and buildings and each other.

Humans can generally figure out how not to bump into things, as can dogs and fish, but getting a machine to figure it out is a lot harder. And that makes it just the kind of problem Leang likes to tackle with his graduate students.



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> He said, 'You guys are going to build a robot,' and I thought, 'I should drop this class right now.'"

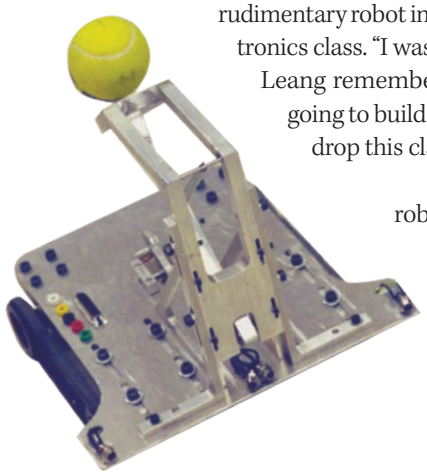
He is working with doctoral student Daman Bareiss MS'14 on collision avoidance, and with other students to teach drones to fly in a reliable pattern, and to get multiple drones to help each other complete a task—to find people trapped in the rubble of a collapsed building, for example. Getting several drones to cooperate is known as "swarming," an apt term considering that even one little drone can sound like a busy crowd of large mosquitoes.

One afternoon last fall, to demonstrate some of the work Leang's team is doing, doctoral student Xiang He launched a small, autonomous (that is to say, not remote-controlled) drone into the 8-by-8-by-8-foot netted cage in the DARC Lab. The copter hovered for a few seconds, as if it were contemplating what to do, and then began flying around the cage, buzzing as it went. Through multiple repetitions, He was trying to teach the drone how to make a perfect circle. "The precision is not as high as I'd like it to be," Leang said as the drone did wobbly rotations around the cage. "We're in the process of figuring out why."

Above, Leang with his family in his youth. Below, his first robot.

Leang was a junior in mechanical engineering at the U in the 1990s when he made his own first rudimentary robot in Professor Sandy Meek's mechatronics class. "I was sitting in the back of the class," Leang remembers, "and he said 'You guys are going to build a robot,' and I thought, 'I should drop this class right now.'"

The assignment: build a small robot that can shoot a ball into a short basket equipped with a light bulb. Like other teams of students, Leang's used light sensors to determine the location of the basket and figure out the angle of the throw, but his team designed a speedy robot that could get to the throw line first. His team won, and he suddenly knew what he wanted to do for the rest of his life.



Despite the fact that the "R" in DARC stands for robotics, however, Leang says he's not a roboticist. "I'm the first to admit that. My expertise is control systems."

Think of controls as the intelligence of a machine, the part that can regulate and manipulate all the variables that come its way. A thermostat is a kind of control system, albeit a very simple one with just one task: to figure out how to keep a room at a constant temperature. For a drone or a robotic arm, the control system is much more complicated: determining how to move itself or something else up and down and around, how to react to its surroundings, how to stay focused.

Leang went on to get a master's degree in mechanical engineering at the U in 1999, and then a doctorate at the University of Washington in 2004, working under former U professor Santosh Devasia. His doctoral work focused on control systems at the nano level, at sizes as small as atoms, not much bigger than a billionth of a meter.

Most of his work since graduating has been in nanopositioning, designing control systems that, for example, can move a probe or a tool with speed and precision onto areas that are so small they can't be seen with a normal microscope. Along with graduate student William Nagel, Leang is currently collaborating with Boston University and startup company Molecular Vista Inc. to design a system with tiny probes that will be able to detect the stiffness of living cells, or "feel" a DNA strand.

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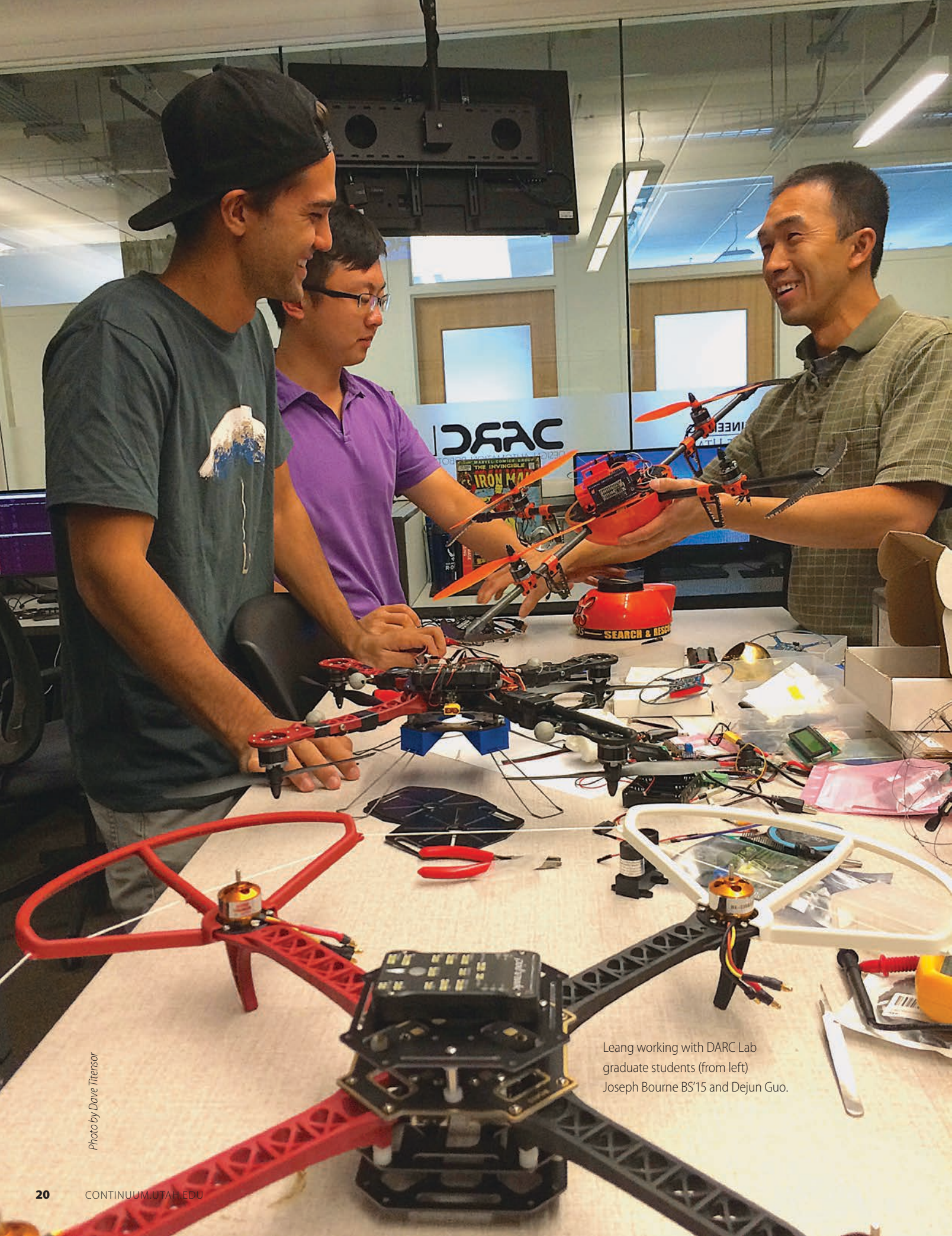

Leang working with DARC Lab graduate students (from left) Joseph Bourne BS'15 and Dejun Guo.

Photo by Dave Titensor

Leang knows that his listeners' eyes can glaze over when he uses terms like "nanopositioning." So he sometimes likens this work to being a crane operator. "That's basically what I do, but on a different scale."

In Cambodia, Leang's father ran a small family-owned convenience store in Battambang, which meant the family was engaged in the free-market economy. And, too, the family is ethnic Chinese—so they had two strikes against them in the eyes of the Khmer Rouge when Pol Pot took over Cambodia in 1975 and began a systematic genocide of what would eventually amount to more than a million people; another million are estimated to have died from starvation. Leang's family was forced to leave Battambang and relocate to a small straw house in the countryside.

A memory: One day, his father and uncle find a light bulb and battery, and they wire it up to provide light after sundown; then a neighbor must have snitched on them, because soon, Khmer Rouge soldiers show up and make his parents get down on their knees at gunpoint. Leang remembers them begging for their lives, and he remembers himself screaming in terror.

Another memory: The family is walking toward the border of Thailand, fleeing Cambodia after Vietnam invaded in 1979. He is hungry and thirsty, and at some point, in an area where there are land mines, his father and uncle find a steel bowl and some muddy water tainted with blood. Leang still remembers the taste of that water.

After being in a refugee camp in Thailand for several months, the family's name was drawn in the weekly lottery for a chance to emigrate to America. They were sponsored by the Don and Carl Borup families of Tremonton, and at first, Kam and his brother, sister, and mother lived in Don's basement. (Their father had to stay behind for several months with their aunt, who was recovering from tuberculosis). At night, little Kam and his brother would sneak upstairs to raid the pantry and then hide the food under their beds. At school, where the brothers didn't understand what anybody said, Kam frequently got "frowny faces" on his writing assignments.

As he grew up, Leang watched his father be resourceful: building furniture from scraps of wood, fashioning a fishing reel out of a soda can and some string. Soon he too was making things: rubber band shooters, bows and arrows, intricate origami. He customized the handlebars of his bike by cutting off the ends. He took the whole bike apart just to see how it worked.

In high school—by then the family had moved to California—he took trigonometry but spent most of the time sitting in the back of the room programming his calculator for poker and electronic *Battleship*. After high school, he enrolled in a junior college, intending to study art.

And then one day he went to see the academic counselor, and she said "Have you thought about engineering?" and he said "I don't really know what

Perhaps, being hungry all the time created an insatiable drive... for more projects and challenges and ideas. More problems to solve.

Leang, an avid skier, on a recent ski vacation with his family.

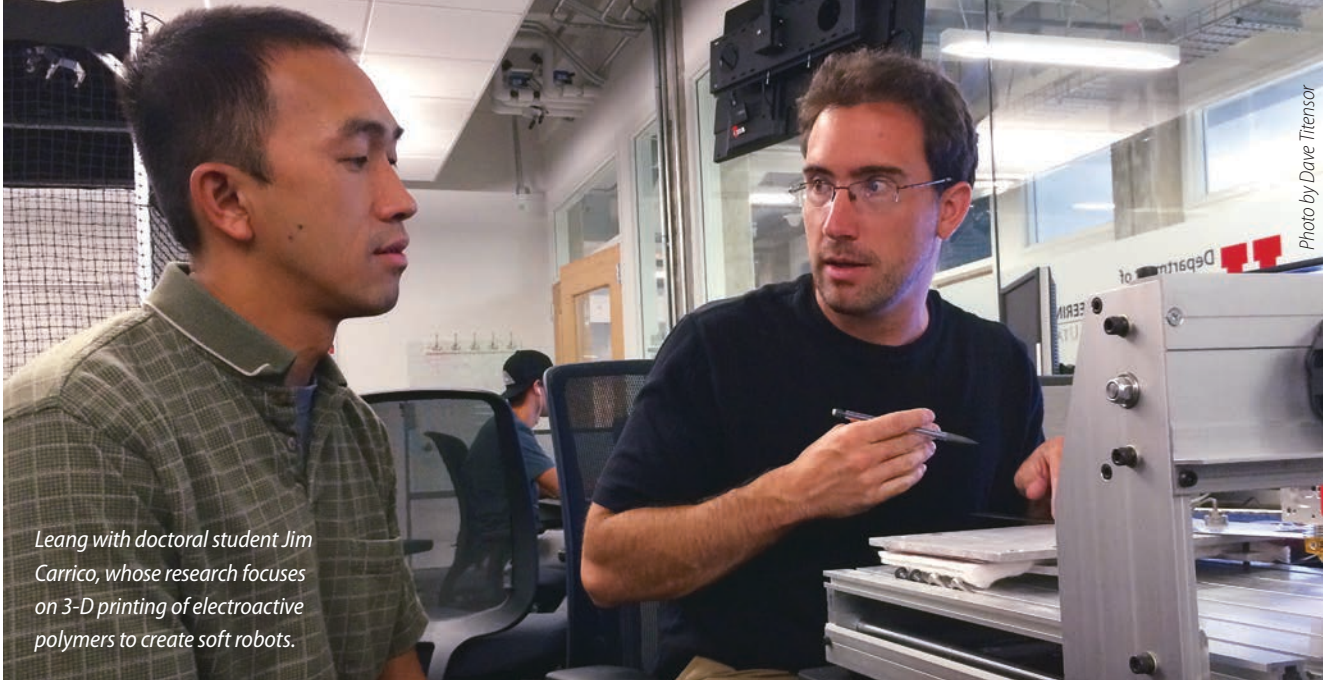

Photo by Dave Tiensor

Leang with doctoral student Jim Carrico, whose research focuses on 3-D printing of electroactive polymers to create soft robots.

that is." The next semester, he enrolled in math and physics classes, and after two years of course work, he transferred to the University of Utah to study mechanical engineering. At least that's the reason he told his parents, although it was skiing that lured him back to Utah. That first year at the U, he skied more than 100 days.

He still loves to ski, and he makes his own skis in his garage. Up until the time he and his wife, Allyson, had their third child this past summer, he skied at least once a month, year-round, for 141 straight months. His definition of skiing: "making at least a couple of turns with skis strapped to my feet, be it on snow, dirt, sand, rocks, or whatever slides." As he explained on a website called *turns-all-year.com*, when asked what his worst ski trip was: "None that I can recall. They have all been fun, even in the rain."

Leang and his students are working on several drone projects, including one nicknamed the "flying nose" (official name: Autonomous Broad Spectrum Environmental Sentinel), a joint project between the U's DARC Lab and Nevada Nanotech Systems Inc.

Nevada Nanotech is providing sensors that can detect chemicals in the air, and Leang's lab is designing the autonomous aerial robot that can carry the sensors. The ultimate goal is to create a swarm of machines that can work together to find, say, bioterrorist toxins, and monitor how far an invisible plume has traveled.

The project has been awarded a $1 million grant from the U.S. Army to develop Phase II. The lab is also utilizing an $800,000 grant from the National Science Foundation to develop ground and aerial robots that can be used as first responders in disasters. And the team is using a recently funded $3.8 million NSF grant to develop 3-D printing technology, spearheaded by doctoral student Jim Carrico, that can print robots from soft materials.

Leang is "very aggressive about seeking funding," notes Professor Tim Ameel, chair of the Department of Mechanical Engineering. This, along with Leang's energy, enthusiasm, and past projects, made him the top candidate in the U's hiring search in 2014, Ameel says, when the department sought to strengthen its robotics program. Leang left a similar but smaller program at the University of Nevada Reno.

The DARC Lab is just one of nearly a dozen robotics-related labs at the U that are working on everything from robot vacuum cleaners to virtual reality. The labs each have their own projects and lab spaces, but they also share a large space—the Utah Robotics Center—that currently houses a self-driving car, two robotic torsos, and a 25-by-25-by-25-foot netted cage where Leang's graduate students can further test their drones.

Like the drones themselves, Leang is a man in motion, scurrying from one task to the next, as if always hungering for more.

"Every day," he says, "I think of something new that I'd like to try."

— Elaine Jarvik is a Salt Lake City-based freelance writer and playwright and a frequent contributor to Continuum.

> "Every day, I think of something new that I'd like to try."

Visit continuum.utah.edu *to view videos about Kam Leang and DARC drones as well as a gallery with more photos.*

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WHEN BRIGHT MINDS TURN

WITH MENTAL HEALTH CONCERNS AMONG COLLEGE STUDENTS ON THE RISE, THE U IS THROWING A LIFELINE.

By Kelley J. P. Lindberg
Photos by Randy Collier

Midway through fall semester of her junior year, MacKenzie Bray was tired—bone-shatteringly tired—of feeling like she was going to die. Her heart was racing, and she was sweating and shaking uncontrollably. It felt like a heart attack. And it wasn't the first time. In fact, it was happening daily,

DARK

and medical doctors couldn't find a physical cause. Symptoms would hit her on buses, in classrooms, or while driving. "I would get this feeling of impending doom, like something's wrong and I have to get out of here *right now*," she says, so she would rush off the bus or leave abruptly in the middle of class. "It was interfering with so much every day." Afraid the attacks might make her pass out while she was driving, she stopped driving home to her parents, who lived only an hour away. "It got to the point where I thought, I just can't do this anymore."

So on that October day, she typed "University of Utah therapy" into her computer… and found the University of Utah Counseling Center and a pathway out of her personal torment.

MacKenzie's story is far from isolated. In fact, the growing number of college students being seen for mental health concerns, such as anxiety, depression, or self-harm issues, is sounding alarms nationwide. In 2014, the annual National Survey of College Counseling Centers, in which the University of Utah participates, revealed that 94 percent of college counseling center directors are seeing a steady increase in students with severe psychological problems. A spring 2014 survey by the American College Health Association showed that 14.3 percent of college students were diagnosed with or treated for anxiety problems (up from 10.4 percent in fall 2008), and 12 percent were seen for depression (up from 10.2 percent in 2008). Still another 2014 report, from the Higher Education Research Institute, found that 59 percent of college seniors had felt depressed, and 35 percent had sought personal counseling in their senior year.

This growth is evident at the University of Utah. According to Lauren Weitzman BS'84, director of the University of Utah's Counseling Center (UCC), the number of students seen in initial "intake" sessions last year (2014-15) rose 13 percent over the previous year. And the total number of students they saw in sessions of direct service rose 14.6 percent, from 1,240 clients to 1,421, continuing a decade-long trend for growing demand at the UCC. More worrying is that the numbers show increasing severity in the mental health issues students struggle with. Last year, 26 percent of their clients reported self-harming behaviors, and more than one third indicated they had thoughts of suicide, with almost half of those serious enough to require intervention. Meanwhile, UCC staff logged 70.8 percent more hours in direct crisis intervention services than in the previous year. As for referring students for hospitalization due to significant mental health reasons, Weitzman says, "It only used to be one or two people for a whole year." But in the first six weeks of Fall Semester 2015 alone, the UCC referred four students for hospitalization. "These trends are sobering."

They are so sobering, in fact, that in October 2014, University of Utah President David Pershing emailed the entire university faculty and staff, reminding them to be alert for signs of distress in their students and to "be prepared to refer them to campus resources designed to provide expert help."

Top 10 reasons

STUDENTS SAY THEY COME IN TO USE THE UCC'S SERVICES:

1. Anxiety (70%)
2. Depression (64%)
3. Stress (59%)
4. Academics (46%)
5. Self-esteem (38%)
6. Loneliness (30%)
7. Relationship with partner (28%)
8. Social anxiety (27%)
9. Relationship with friends (20%)
10. Family I grew up in (19%)

Source: University Counseling Center

MacKenzie picked up the phone and was soon sitting in a UCC therapist's office. By the end of that first appointment, the therapist had identified MacKenzie's attacks as a panic disorder. She was confident she could help MacKenzie understand what was happening to her and learn to manage it. "I was bawling in that first intake meeting," says MacKenzie. "I had a feeling of great relief. I remember that bus ride home—I thought, this is the first time I've felt okay in four years."

What the numbers don't show is *why* more college students are being seen by mental health professionals than ever before. Are today's students really in worse shape, mental-health-wise? Or are they simply more willing to seek help, so that they are finally being tallied?

Recently, the stigma surrounding common mental health issues such as depression and anxiety—while certainly not lifted—has been lessening. Psychologists, talk show hosts, and celebrities are slowly chipping away at barriers that discourage people from getting assistance. Our society is finally, albeit in baby steps, making it easier to ask for help. "I feel that with more and more people seeking mental health support, we've normalized that help-seeking behavior," says Katie Stiel MEd'10, program manager for the Center for Student Wellness. Tony

Lauren Weitzman

Kemmochi MS'05, prevention and outreach coordinator for the UCC, agrees: "One reason why [we're seeing an increase in mental health issues] comes from a positive change. Mental health care is more accessible." Many students are getting help earlier, too, so more are finding it possible to enter college in the first place, and more are entering college already on medication. In fact, 86 percent of counseling center directors in the 2014 National Survey of College Counseling Centers reported a steady increase in the number of students arriving on their campus already on psychiatric medication. At the UCC last year, says Weitzman, "Fifty-six percent of our clients had utilized mental health services previously, and 40 percent had taken medication."

So today's students may not necessarily be more distressed than students in the past, those on the ground say. We may just finally be seeing a truer picture of how widespread mental health concerns actually are among students.

Either way, President Pershing views the numbers as a call for action, saying, "We consider it a good sign that more students are utilizing valuable resources when they struggle with depression, anxiety, unexpected loss, or trauma." Battling mental health concerns can greatly affect a student's ability to study, learn, and even remain in college, he and others acknowledge.

According to Christine Contestable PhD'10, a Student Success Advocate acting under the U's Student Success and Empowerment Initiative, the U's goal isn't just to help students graduate with the required credentials, but also to help them "have a more meaningful, transformative experience while they're here." Letting students fall through the cracks because of anxiety, depression, or the emotional ramifications of a family tragedy runs counter to both goals. That's why the U is reaching out, normalizing help-seeking behavior, and helping students navigate through their issues to success.

Top 10 factors

AFFECTING UNIVERSITY OF UTAH STUDENTS ACADEMICALLY:

1. Stress
2. Anxiety
3. Sleep
4. Work
5. Depression
6. Cold/Flu/Sore Throat
7. Internet use/computer
8. Concern for a troubled friend or family member
9. Finances
10. Participation in extracurricular activities

Source: Center for Student Wellness

Over the course of eight counseling sessions, MacKenzie learned why her body reacted physically to stressful situations. "I realized what would work best for me, and what my triggers are." Her counselor soon had her riding buses, for short distances at first, building up a sense of control. Then they tackled driving on the freeway—at slow times first, then gradually working up to rush hour. Relatively quickly, MacKenzie was able to recognize "this is what it is, and this is how you can control it and not have it control you."

The UCC, located within the Student Services Building, is the primary hub for clinical mental health resources at the U. Its permanent clinical staff consists of 12 professionals—psychologists and clinical social workers—and, for limited hours each week, a psychiatrist. Together with about two dozen clinical trainees, they provide developmental, preventive, and therapeutic services to the University's 31,000 students.

"Our top three reasons why students say they are coming here are always anxiety, depression, and stress," Weitzman explains. "The big question is, why are people more anxious and depressed?" Weitzman says theories include a modern parenting style that doesn't encourage resiliency, increasing feelings of isolation, too much interaction with technology instead of the outside world, and even a societal shift from internal values (such as altruism or volunteering) to external values (bigger houses and nicer cars). "We're still trying to sort that through, but the reality is, for whatever reason, the severity seems to be increasing."

The UCC's services include counseling sessions, anxiety-reducing workshops at the Mindfulness Center, and couples counseling. If a student requires more intensive treatment, counselors help the student access off-campus resources.

Katie Stiel

Across campus in the Eccles Student Life Center, the three staff members of the Center for Student Wellness (CSW), plus one full-time victim advocate, focus on educating the student population on health and wellness issues. "We are the outreach and education arm of the Counseling Center and Student Health Center," says program manager Stiel. The CSW partners with university departments and student leaders to provide skill-building workshops or programs for their members. Armed with data identifying stressors that impact students' academic abilities, Stiel says, "We could go to the Personal Money Management Center and say, 'Hey, finances was No. 9 [on our list]. Can we partner with you on an event?' " Or she might offer, "Let's do a stress reduction workshop" or "What does your community need?"

The CSW doesn't provide clinical help themselves, but they act as a clearinghouse, connecting students, faculty, and staff to health and wellness resources on and off campus. "In our office, we just want to encourage students to reach out," says Stiel. "Reach out now, before you're freaked out and panicked and so overwhelmed that you can't function."

Another resource for U students isn't found in an office at all. Instead, the eight Student Success Advocates carry their offices in their backpacks while they walk around campus meeting students. Their objective? To connect students with resources that can "help them get the most out of their time at the U by making use of the amazing opportunities here," says Contestable. The Student Success Advocates make themselves available at different places on campus every day, introducing themselves to students and discussing what they need to be successful. While that can mean help landing an internship or advice on applying for a scholarship, Contestable says they may, at times, encounter students struggling with mental health issues. Like the CSW, the advocates are plugged into the U's web of resources. "That may include making contact with the Counseling Center, the Women's Resource Center, the LGBT Resource Center, or the Center for Ethnic Student Affairs," says Contestable. "We are reaching toward them instead of hoping they find resources on their own."

Mental Health Snapshot
OF COLLEGE FRESHMEN NATIONWIDE

According to the 2014 Cooperative Institutional Research Program Freshman Survey, published by the Higher Education Research Institute, when college and university freshmen nationwide were asked about their first year:

37% had a hard time adjusting to the demands of college

55% felt isolated from campus life

47% struggled to manage their time effectively

37% had a tough time developing effective study skills

45% frequently felt overwhelmed by all they had to do

Now a senior, MacKenzie says her panic attacks occur only once or twice a month these days, and they're less severe. "Knowing that I'm not dying and I'm not going to pass out, it's much easier to deal with," she says. "Now I'm not scared of getting them anymore."

The UCC, the CSW, the Student Success Advocates—all three echo the importance of outreach. "Traditionally, we sat back and waited for students to come in," says Kemmochi. "Now we're doing outreach to proactively find those students." Whether it's walking up to students in the library, sponsoring a Wellness Fair, speaking at New Student Orientation, blasting out stress-reduction advice on social media, adding resources to mobile apps, or handing out bookmarks printed with tips on getting a good night's sleep, the organizations tasked with helping students are finding new ways to present a visible face on campus, making it easier for students to find support.

Still, they can't make individual contact with every student. That's why the U's faculty and staff are an essential link in the support chain. They are often the first to notice signs of a student in distress, whether it's out-of-character behavior in class, disturbing topics in a homework assignment, or a student suddenly opening up during a discussion. "Those are like our inside people," says Stiel. "To get their buy-in is really important, because they're seeing students in their own environment." Weitzman and Stiel, in collaboration with the Dean of Students office, produced a presentation that guides faculty and staff in recognizing distress, listening and communicating, and referring students to campus resources. In addition, the UCC provides liaisons to every academic department, so that faculty and staff have a personal contact they can approach for advice. President Pershing also encourages faculty and staff to be willing to step in, saying, "Those of us who interact daily with students must stay attuned to warning signs they may exhibit when experiencing severe distress."

Says Stiel, "We tend to think it's none of our business to ask these kinds of questions, but we're here to develop students and be resources to them in their quest for academia. Our sole purpose is to help students graduate, and that sometimes requires us to be uncomfortable, especially with health and wellness topics."

Because of her UCC counseling, MacKenzie says, "There are a lot of things I've done that I would not have done before." She ran in the Ogden Marathon last spring, just months after finishing therapy. At mile 15, she had a panic attack but talked herself through what she was feeling. Deciding the attack was just her body assuming she was running because something was wrong (the "fight or flight" reaction), she told herself, "I'm just going to try to get to mile 20. If I get to mile 20, then I'll be fine." She made it all the way to the finish line.

Christine Contestable talks with a student in the Olpin Student Union.

MacKenzie Bray

The next day, she left for a study abroad course in Austria. Flying alone and leaving the country for her first time, she wasn't surprised when another attack happened. "Before, it would have been, 'Turn the plane around, I need to go home! Something's terribly wrong with me!'" she says. "But it's that whole thing of 'get comfortable with being uncomfortable.' " Once MacKenzie accepted that she would be uncomfortable until she settled into her new routine abroad, she was able to manage her body's response and keep moving forward. "That was kind of life-changing."

Learning to manage her panic disorder has given MacKenzie new confidence in her own strength, even in situations that are stressful for anyone. "I don't mind giving presentations in class anymore, because my heart will be pounding, but I'm like, 'I'm used to this, I can deal with this.' I won't say I like the panic attacks, but they made me realize something good can come from this."

> **Knowing that I'm not dying** and I'm not going to pass out, it's much easier to deal with."

While some of the recent statistics from the UCC are alarming, others show promise. According to Weitzman, 47 percent of the UCC's clients say counseling has helped them increase their academic performance, and 70 percent say counseling has enhanced their U experience. And of the 29 percent of clients who indicated they were thinking of leaving the U before they entered counseling, 70 percent said counseling helped them stay.

"I think we should step into the reality that mental health and wellness are a big factor of our college students' success," says Stiel. "We know if they're feeling well, they're going to do well, and don't we want them to do well? That's the whole point of college, right?"

— Kelley J. P. Lindberg BS'84 is a freelance writer based in Layton, Utah.

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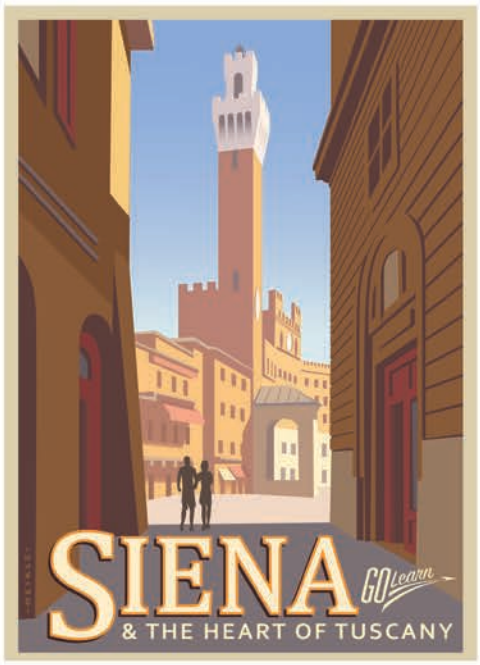

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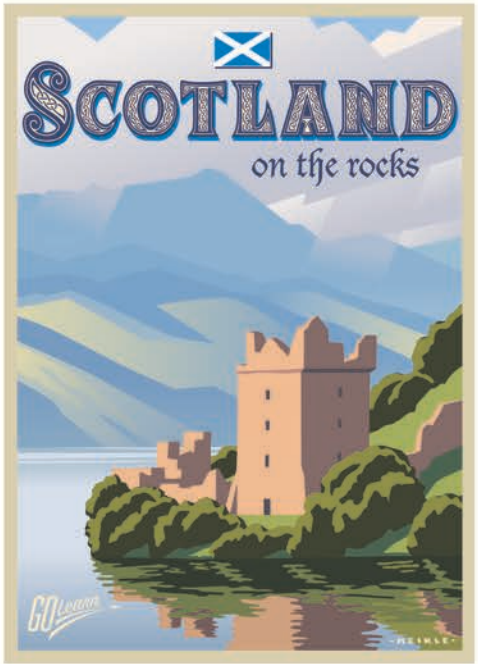

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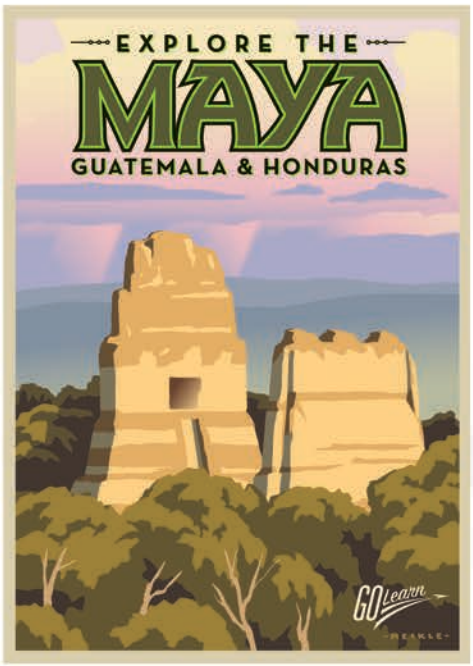

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YOUNG, SCRAPPY, AND HUNGRY

// LYNNE ROBERTS BRINGS HER UNDERDOG SPIRIT TO UTAH WOMEN'S BASKETBALL. //

Story and photos by Stephen Speckman

"THIS JOB JUST FIT MY **PERSONALITY**. THERE'S KIND OF **A BLUE-COLLAR, UNDERDOG, CHIP-ON-YOUR-SHOULDER MENTALITY** HERE WITH THE TEAM THAT RESONATES WITH ME."

As a girl growing up in rural Shasta County, California, a scrappy Lynne Roberts had to earn her first points in basketball by shooting high-arcing jumpers over her father and two older, taller brothers. She recalls dejectedly watching her shot attempts being blocked into a nearby cow pasture. A girl on a street full of boys who let her humbly hike the ball during pickup football games, she used the omnipresent good-natured sibling ribbing—that she wasn't big, strong, or fast enough—as motivation to relentlessly work on her many games, earning 12 varsity letters in high school sports. Those countless hours of two-on-two in the family's driveway and always playing "catch-up" with the boys in her life were the seeds of a competitive streak that grew and has propelled her through the arc of her personal and professional trajectory.

Now Roberts, 40, stands in her office as the newly minted head coach of the University of Utah's women's basketball team, marveling at how the space is bigger—more than 900 square feet—than her first home as an adult. Her office—like men's basketball head coach Larry Krystkowiak's—is in the new 101,000-square-foot Jon M. & Karen Huntsman Basketball Facility, with views of the Wasatch Mountains to the east and the Oquirrh Mountains out west across the Utah campus and Salt Lake Valley. They both have a fireplace, a 60-inch retractable television, and a private bathroom with a shower. Each space is equally impressive and a reminder to Roberts, despite her past successes as a coach in college basketball, that she still needs to earn some respect as a head coach in the Pac-12, where the Utes women's team so far hasn't made a lot of noise since joining the conference in 2011.

Roberts started making her own noise at Enterprise High School in Redding, California, excelling in tennis, volleyball, softball, track, soccer— "I did them all"—and, of course, basketball. She earned a scholarship to play basketball at Seattle Pacific University, where she admits she cared at first more about sports and socializing. As a senior, she was named to the NCAA West Regional all-tournament team, and by that time she had settled down academically to finish in 1997 with a degree in history, following in the footsteps of a mother who taught history at a junior high. (Her father was a vice president for berry grower Driscoll's.) She stayed at Seattle Pacific to get a master's in athletic administration in 2000. "It was the first time in my life that I was passionate about school," Roberts says. Her coach, Gordy Presnell (now head coach of the women's team at Boise State), told Roberts she would be good at coaching, and she

"SHE'S **TOUGH, PASSIONATE**, THOSE TYPE OF THINGS WE WANT OUR KIDS TO TAKE ON."

became his assistant in Seattle from 1997-2001, advancing each season to the NCAA Division II tournament.

On her own as a head coach, the 2014-15 West Coast Conference Co-Coach of the Year has proven her mettle, racking up an 86-33 record while head coach at California State University, Chico, from 2002-06, and becoming the California Collegiate Athletic Association Coach of the Year for two years in a row (as well as the 2004-05 WBCA West Region Coach of the Year). From 2006-15, she turned around a losing University of Pacific team in Stockton, Calif., taking it into the first round of the WNIT the past two years, and was also named the conference coach of the year in 2012-13.

Utah Athletics Director Chris Hill MEd'74 PhD'82 is hopeful that Roberts, who signed a six-year, $1.65 million deal, will be the change the Utes need after

releasing coach Anthony Levrets last spring. "I think we have a high expectation for our women's basketball team," says Hill. "We have a great history, and we weren't attaining what we thought we could. We're fortunate enough to have hired someone who we think is going to be really, really good—and we're excited about it." He describes Roberts as "smart, personable, and someone who has a lot of connections with recruiting." Now that his department has set up Roberts in a new basketball facility, which Hill notes is a "tremendous recruiting tool," he says it's time to stand aside and let her build the team into a perennial top contender. "It's going to take a while, because it's a rebuilding process, just like it was with Coach Krystkowiak on the men's side," Hill says. "We anticipate that in five years we will be the type of team that's in the NCAA tournament quite a bit and having a chance to advance in certain years and get to the Sweet 16 and be a major post-season player. But that's going to take a couple of years."

Hill says Utah Athletics has given the financial backing Roberts needs to build her staff. She wasted no time assembling her coaching staff after she was hired last April, bringing on board former Utah State player and coach Danyelle Snelgro, who also coached at Fresno State University and Texas Christian University, and Wesley Brooks, who coached at four schools including the University of North Texas, where he was the past four seasons. She has also brought on new marketing and video production hires to help her amp up excitement. But her first acquisition was Assistant Coach Gavin Petersen, who for the past two seasons had been an assistant to Roberts at Pacific. Petersen says it was an "easy" decision to join Roberts at Utah. "We work really well together," he says. "We complement each other."

Petersen calls Roberts a "competitor," someone who "prepares hard" and uses humor to maintain a balance and a kind

of "family" atmosphere. Illustrative of the effects of that balance, he points to a game toward the end of last season, with Pacific going into hostile territory on Gonzaga's home court, on Senior Night, in front of a sold-out audience. The perennial West Coast Conference champions earlier in the season had beat the Tigers on Pacific's own court and had already sealed a top seed in the playoffs, and Pacific was vying for a second or third seed. "We ended up winning—it was awesome," Petersen says. "She's tough, passionate, those type of things we want our kids to take on…. It happens slowly, but it will happen."

Emily Potter, the talented 6'6" forward from Winnipeg, Canada, who redshirted last season with a knee injury under Levrets, comes back eligible for three more seasons under new coach Roberts. "It's definitely been an adjustment—I think for all of us," Potter says. "None of us have gone through anything like this before—so, it's kind of like uncharted waters. But it's been going well so far." Potter says she likes that Roberts was "honest" with her from the start and asked for her trust with regard to the direction she wants to take the team. Potter also describes the team as a family playing in a conference where they haven't yet gained respect. "It really motivates us all," she says. "We have a little bit of a chip on our shoulders."

That "chip" is partly what drew Roberts to Utah. "As a competitor, I want to have a chance to win at the highest level," she says. "This job just fit my personality. There's kind of a blue-collar, underdog, chip-on-your-shoulder mentality here with the team that resonates with me. I love coaching that. We're the new guys in the conference, and people kind of pat you on the head and say, 'Yeah, yeah, you'll get there someday.' I love that. That motivates me like nothing else."

Utah Senior Associate Athletics Director Nona Richardson oversaw the search for a new head coach and likes Roberts' intensity, "basketball savvy," the respect she gained at Pacific and Chico State, and that she knows how to surround herself with the right people. "You can't do it alone," Richardson says. Roberts, she adds, has her "pedal to the metal; she's still working her way upward," and is poised to bring "relevance" back to a program that through 2014 has the 14th best all-time winning percentage in Division 1 women's college basketball. Comparisons by Richardson and others, of course, lead to former Utes head coach Elaine Elliott, who in 27 seasons at Utah amassed a 582-234 record (Elliott retired from the U and is now an assistant coach at Salt Lake Community College). Their style of play, Richardson says, is more upbeat, faster tempo, and their approach to the game is to recruit the right kids, be disciplined, run hard, and "approach every day as if it's your last."

"What she did here is so cool," says Roberts, who mentions the long line of proud former players who still feel like it's "their program." She talks about how the game has changed and how, ironically, the players these days are bigger, stronger, and faster—traits her brothers teased her about as a child. "Recruiting is everything," she says, pointing to assistants with strong ties to deep reservoirs of talent in Texas and California. "It's a great time to be at Utah," she adds, referring in part to the new basketball facility that she calls the

"AS A **COMPETITOR**, I WANT TO HAVE A CHANCE TO **WIN** AT **THE HIGHEST LEVEL.**"

"FIND SOMETHING YOU **LOVE**, THAT YOU'RE **INTERESTED IN** AND THINK YOU MIGHT WANT TO DO, AND **PURSUE IT.**"

best in the country. "All of those things add up," Roberts says. "That said, we're going to have to work our tails off as coaches to get some street cred out there."

By the end of this past summer, Roberts was settling nicely into Utah. "I've been so impressed with the people here. There's like a familial feel to it." And with the mountain ranges out both directions from her office, "I'm still blown away by the beauty," she says. She might even find time in her office to kick back on the new furniture and read a book. Roberts prefers reading about great leaders—not necessarily in sports—like President Harry S. Truman, who she points out faced the difficult task of how to end a world war. "I think his story is a great story of leadership."

Instead of following her brothers into medicine to become a doctor, her father into the berry business, or her mother into teaching, Roberts has herself become a leader on and off the court, mentoring her players to also focus on academics. In 13 years as a head coach, she's never had a player be ineligible because of grades, and 100 percent of her players have graduated from college. "I feel like I have a pretty good balance with the academic piece," she says. "Even if any of these guys go on to play professionally, they're not going to sign a $90 million contract with Nike. They're going to have to, at some point, hang up the high tops and do something else to pay the bills. As a coach, I do take that responsibility very seriously."

One of Roberts' most important messages to players? "Find something you love, that you're interested in and think you might want to do, and pursue it—and let basketball be a way that you can really enhance your collegiate experience, and get it paid for. But at the end of the day, get your degree in something you care about."

—Stephen Speckman is a Salt Lake City-based writer and photographer and a frequent contributor to Continuum.

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1970s

Gregory Thompson MA'71 PhD'81, associate dean for special collections at the U's J. Willard Marriott Library and an adjunct assistant professor of history, received the 2015 Lifetime Achievement Award from the Conference of Inter-Mountain Archivists. The award recognizes individuals who have demonstrated considerable service and leadership in the Intermountain West and who have made significant contributions to the organization or the archival profession.

Thompson has published several monographs on the Ute Tribe, is a founding board member of the Alf Engen Ski Museum, and is the general editor of the Tanner Trust Publication Series *Utah, The Mormons, and the West*.

Linda S. Tyler BS'78 PharmD'81 received the 2015 John W. Webb Lecture Award from the American Society of Health-System Pharmacists. The award honors pharmacy practitioners or educators for their dedication to fostering excellence in pharmacy management and leadership.

As administrative director of pharmacy services at the U's Hospitals and Clinics, Tyler oversees pharmacy operations at four hospitals, 10 ambulatory clinics, and 14 outpatient pharmacies. She also serves as associate dean of pharmacy practice and clinical professor of pharmacotherapy at the U's College of Pharmacy.

Tyler is recognized as a visionary leader, inspiring mentor, and exemplary academician. She was one of the first in the country to develop standards in drug information services (work that helped create the National Drug Shortage Database) and grew the U's program into one of the premier services of its kind.

MERIT OF HONOR AWARDS RECOGNIZE FIVE U ALUMNI

Andrew B. Christensen

Mary Kay Griffin

Lily Yuriko Nakai Havey

Kathie Kercher Horman

J. Spencer Kinard

The Emeritus Alumni Board selected five outstanding alumni to receive 2015 Merit of Honor Awards. The annual awards recognize U alumni who graduated 40 or more years ago whose careers have been marked by outstanding service to the University, their professions, and their communities. This year's recipients are **Andrew B. Christensen** BS'62, **Mary Kay Griffin** BA'70, **Lily Yuriko Nakai Havey** BFA'55 MFA'55, **Kathie Kercher Horman** BA'65, and **J. Spencer Kinard** BS'66.

To recognize the recipients, the Emeritus Alumni Board in November hosted a banquet in their honor at the new Spencer Fox Eccles Business Building on campus. **Ruth Watkins**, the U's senior vice president for academic affairs, served as the featured speaker, while **Rex Thornton** BS'72, a past president of the U Alumni Association's Board of Directors, was the evening's master of ceremonies.

With a doctorate in physics, Andrew Christensen has held senior leadership positions with The Aerospace Corporation, the Atmospheric Science Office of the National Science Foundation, the National Oceanic and Atmospheric Administration, and more. He currently teaches at Dixie State University in St. George, Utah, while leading two projects for NASA and contributing to various others. He has authored or coauthored 100-some papers in peer-reviewed scientific journals.

Mary Kay Griffin is the managing director of CBIZ MHM, LLC, one of the nation's top providers of accounting, tax, and advisory services. She has been recognized by United Way as Council Member of the Year and by the Salt Lake Chamber's Women's Business Center as a Pathfinder. She has also been honored as a Distinguished Alumnus of the U's School of Accounting.

Lily Nakai Havey graduated from the New England Conservatory of Music, obtained a master's degree in fine arts from the U, and taught high school English, creative writing, and humanities. She also established an acclaimed stained glass business. She recently published the award-winning book *Gasa Gasa Girl Goes to Camp: A Nisei Youth Behind a World War II Fence* about her family's time in an American internment camp.

Kathie Kercher Horman's eclectic community activities have ranged from serving as president of the U's Pioneer Theatre Guild to leading the Rocky Mountain Morgan Horse Club. She currently serves on the advisory board of the U's School of Music and the board of Red Butte Garden. She has been recognized with the Sandy City Humanitarian of the Year Award.

Spencer Kinard is best known for his many years as an announcer with the Mormon Tabernacle Choir and its weekly Sunday broadcast. He was also a longtime vice president and news director at KSL-TV and Radio and helped establish KJZZ TV. Kinard has served as president of the U Alumni Association, a member of the U Board of Trustees, and chairman of the national Radio-Television News Directors Association. He is in the Utah Broadcasters Association Hall of Fame.

ALUMNI HOMECOMING EVENTS GROW SCHOLARSHIPS, SPREAD SPIRIT

During a rousing week of events from October 2 to 11, Homecoming 2015 brought together alumni and friends to connect with each other and the U and raise funds for student scholarships. New this year, the Alumni Association held some exciting social media contests around the 2015 Homecoming theme, "#UUThrowback." In the memory photo division, **Bill Barnes** took 1st Place for a photo of his father painting the Block U, winning a football jersey signed by Coach Whittingham and the team captains. U alum **Brian Victor** BS'95 took 2nd Place for a photo taken of him the day he graduated from the U. His prize included balls signed by the women's soccer and volleyball teams. Check out the Alumni Association's Facebook, Instagram, and other social media pages to see the winning photos and stay in the loop year-round.

Homecoming Week events kicked off on Friday, October 2, with a student dance at The Depot in downtown Salt Lake City. The following Tuesday, campus groups participated in the traditional House Decorating Contest on Greek Row and at various other campus locations, using the Homecoming #UUThrowback theme as inspiration for their design. The Greek Row winner was Pi Beta Phi sorority; the campus winner was the Alumni House, decorated by the Student Alumni Board.

The U's emeritus alumni—those who graduated 40 or more years ago (or who have reached age 65)—gathered for their Homecoming reunion dinner on Wednesday evening at the Alumni House, where they heard a talk by Tommy Connor, men's basketball assistant coach, and had a tour of the stunning new Jon M. and Karen Huntsman Basketball Facility, which recently opened.

Fraternity and sorority members competed in the annual Songfest on Thursday, with Alpha Chi Omega and Sigma Phi Epsilon taking top honors. That evening, students and alumni gathered for a pep rally at the Union Building.

Friday events included the Utes competing in home games for both women's soccer and women's volleyball, and the start of Parent/Family Weekend, where prospective students and their families visit campus for a taste of student life.

Excitement was in the air on Saturday morning, October 10, as a crowd of Utah fans—from toddlers to seniors, decked in red and white—gathered in front of the Alumni House for the start of the annual Young Alumni Homecoming Scholarship 5K and Kids 1K Run/Walk. The event raised more than $53,000 for U scholarships, and awards were given in different race categories, including for fastest runner, best dressed, and the one with the most spirit. All 556 runners—and walkers (some with dogs)—were eligible to win raffle prizes, including a kayak. As afternoon approached, the crowds headed to Rice-Eccles Stadium for the Alumni Association's pre-game tailgate party on Guardsman Way. The week-long events culminated with the Utes playing the University of California, Berkeley, in a triumphant 30-24 win.

DEEP UNDERGROUND, A Rising Star

By Ann Floor

One of the greatest fossil discoveries of the last half century—a new hominin species called *Homo naledi*—was announced this past September by an international team of more than 60 scientists, including **Eric Roberts** PhD'05, a geologist and senior lecturer in the Department of Earth and Oceans at James Cook University, in Townsville, Australia.

The team's findings inside the Rising Star Cave, located 30 miles northwest of Johannesburg, South Africa, are described in two papers published in the journal *eLife*, and the story was featured on the cover of the October edition of *National Geographic*.

Homo naledi (the word naledi means "star" in the southern African language of Sotho) stood around five feet high and weighed roughly 100 pounds. It had a small brain about the size of an orange, and apelike shoulders. It also had human characteristics. Its wrist, palm, and thumb were humanlike, but its long curved fingers were suitable for climbing trees—"a mixture of primitive features and evolved features," as one researcher described it. As of September 23, more than 1,500 bones representing at least 15 individuals—ranging from infants to the elderly—had been recovered from the dried mud floor of the Dinaledi Chamber (the "chamber of stars," the location in the cave system where the fossils were found). Among the remains were skulls, jaws, ribs, hundreds of teeth, a nearly complete foot, and a hand—with virtually every bone intact.

The retrieval of bones began in September 2013, but details were kept secret until fall 2015 in order to maintain the integrity of the science and provide time for the evidence to be carefully examined. "This is the single largest early hominin bone accumulation in Africa, and there are many, many more waiting to be carefully excavated," says Roberts. "The challenge was working out the geology without disturbing or damaging the many bones that literally covered the floor of the chamber." Roberts was working on another project with the team that first explored the Rising Star Cave and heard about the find shortly after its discovery. "Because of that association, and more importantly, because I was small enough—and perhaps crazy enough—to go down into the Dinaledi Chamber to map the cave geology, I was asked to participate." He remains the only geologist who has entered the chamber and has now spent more than a full week there.

Photo by Paul Dirks

Eric Roberts, center, with cavers Rick Hunter and Steven Tucker, who contacted scientists about what they found in the Dinaledi Chamber in late 2013.

Access to Dinaledi from the surface of the ground takes about 30 minutes, and for many, it is impossible to reach. The narrow passageway is in some parts just seven or eight inches wide. (The first scientists to descend were all slightly built female paleoanthropologists.) The first time Roberts headed in, he wasn't sure he could fit down the 13-yard-long vertical crack that is the only entrance into the fossil-filled room. The chute opens up over a cone-shaped mound of materials that have fallen into the space over time, like the dome made when sifting flour through a strainer. Debris covers a slanted mud floor that drains down several more yards, following tight fractures on the floor. The bones were discovered along this fracture system.

"I was very nervous, to be honest," says Roberts, when recounting the first time he went into the cave. "I was not entirely sure I could fit through the narrow crack. After thirty minutes of quasi-panic, I finally figured out how to orient my body so I could squeeze through." Upon getting to the chamber floor and seeing the fossils, he says, "I turned off my headlamp and just sat in the dark for a while thinking about the importance of the site. It was only at this point that the significance of the discovery really sank in, and it was a pretty profound moment."

The biggest question for Roberts is trying to understand how so many bodies got into this truly difficult-to-access chamber. There is no evidence of other animals being there, or that sunlight has ever hit the cave, or of debris washing into or out of it (although when the rainy season hits, water does seep into the chamber from the ground above). The only thing in the room is a carpet of bones covering the floor six inches deep. If it was a ritual burial ground, how did the other *naledis* get the bodies to that space? How long have they been there? Although some things are known about *naledi*, much more remains a mystery. Study of the fossil site will most likely continue for decades.

Roberts first became interested in geology during his freshman year at a small college in Iowa. By the time he was a doctoral student at the University of Utah, he was studying sedimentary geology and paleontology and enjoying the opportunity to work on the Kaiparowits Basin Project, providing geologic context to some of the dinosaur discoveries being made at that time in the Grand Staircase-Escalante National Monument. "I specifically wanted to work with Dr. Margie Chan because of her international reputation in clastic sedimentology" [the study of sedimentary rocks made of particles that are products of weathering at or near the Earth's surface], and to combine his studies with other University of Utah experts in paleontology such as professors Scott Sampson and A.A. (Tony) Ekdale, he says.

Now, 10 years later, he's part of a team uncovering the mysteries of an incredible find and is committed to getting the facts right. "We look at what's below the bones and what's above the bones. We date the rocks using uranium lead dating and pay special attention to avoiding contamination, which could result in getting an inaccurate age," he says. "We want to go slowly. By the time we publish a date, we will have used two or three different methods to determine it. We are committed to waiting until we have multiple lines of evidence."

The Rising Star Cave is located in the area of South Africa that became known as the "Cradle of Humankind" because it has revealed a vast number of hominin fossils, and some of the oldest yet found. After finishing his teaching responsibilities this November, Roberts returned to do more work in the cave through December. "Our absolute focus now is dating the deposits and the hominin bones, and my role remains central to this," he says. "I will continue to work in the chamber and to study the geology of other portions of the cave system. As a result of renewed exploration in the Cradle of Humankind, new hominin discoveries are sure to be made by our team in other caves in the region. We have a team of cavers dedicated to looking for new sites."

—Ann Floor is an associate editor of Continuum.

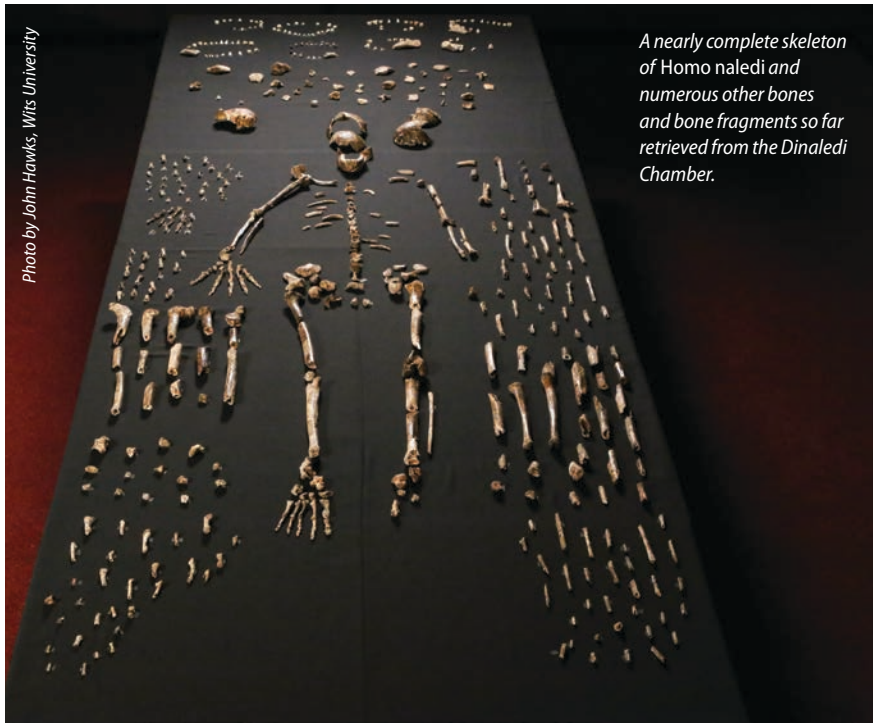


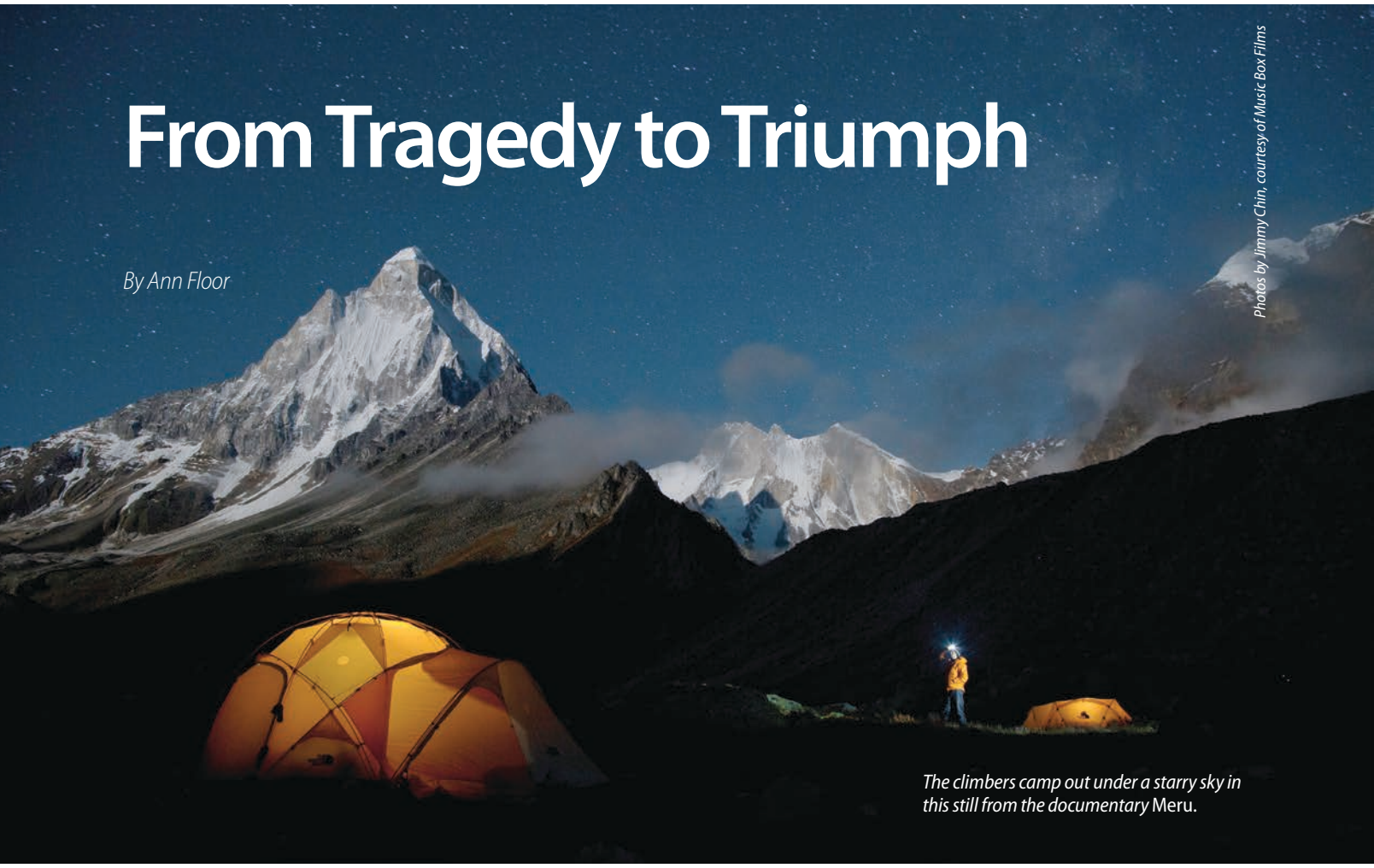
Photo by John Hawks, Wits University

A nearly complete skeleton of Homo naledi *and numerous other bones and bone fragments so far retrieved from the Dinaledi Chamber.*

Visit continuum.utah.edu *to view a gallery with more photos.*

From Tragedy to Triumph

By Ann Floor



Photos by Jimmy Chin, courtesy of Music Box Films

The climbers camp out under a starry sky in this still from the documentary Meru.

Last January, the riveting and spectacular film *Meru* received the Sundance Film Festival's 2015 Audience Award for U.S. Documentary. The films tells the story of **Conrad Anker** BA'88, legendary mountaineer and author, who successfully led a team of three elite climbers—which in addition to himself included filmmaker and director Jimmy Chin and landscape artist and filmmaker Renan Ozturk—up the Himalayas' Mount Meru Central via the highly challenging and technically difficult Shark's Fin. The climb took place over a 12-day period in 2011, with the team reaching Meru's summit on October 2.

Located in northern India's Garhwal Himalaya range, Mount Meru is considered sacred in Hindu, Jain, and Buddhist cosmology and is believed by some to be the center of all physical, metaphysical, and spiritual universes. The Shark's Fin route is notoriously difficult because the altitude is almost 21,000 feet, and its sheer granite walls—1,500 feet high—don't have a lot of cracks, making it challenging to "gear in." Literally dozens of teams have tried and failed to make it. In fact, the Shark's Fin has seen more failed attempts by elite climbing teams than any other peak in the Himalayas. Anker, Chin, and Ozturk became the first team ever to complete the previously unclimbable route.

Anker made his initial attempt in 2003. He tried again in 2008, with Chin and Ozturk, but after encountering severe weather and running low on food, they turned back just 100-some meters below the summit. At the time, Anker said he would not be coming back. But in 2011, after Chin lived through being swept away in a crushing avalanche and Ozturk survived and recovered from a critically serious head injury, the three committed to make one more attempt—and succeeded.

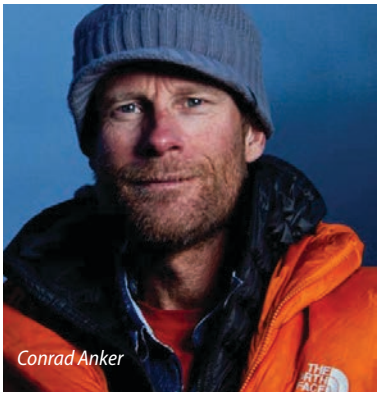
The film *Meru* (which received a national release last August) is about much more than climbing. It's about danger, fear, risk; exhilaration, obsession, drive; trust, love, paying tribute, commitment, character, and deep friendship. Anker's resolve to reach the summit was driven by some critically important relationships with other climbers, especially those with Terrence "Mugs" Stump, his first mentor, who died in 1992 while guiding clients on Denali (Stump had tried to climb the Shark's Fin in 1988 but failed), and Anker's dear friend

"The film is about the life, the loss, the elation, and ultimately, the intractable decisions faced by people who've made a life of climbing the big mountains."

and mountaineering comrade Alex Lowe, who was killed in an avalanche while climbing in China in 1999 (the same year that Anker discovered the remains of famed early 20th-century English explorer and mountaineer George Mallory on the northeast edge of Mount Everest). Anker later married Lowe's widow, Jennifer, and adopted their three sons. The family lives in Bozeman, Montana.

The loss of these two men had an enormous impact on Anker. "With the film, our hope was not just to give people a visceral experience of modern, cutting-edge mountain climbing, but more importantly, an honest look at the life, the loss, the elation, and ultimately, the intractable decisions faced by people who've made a life of climbing the big mountains," he says.

Born in California, Anker started climbing peaks with his family at a young age. When he was 14, he advanced to belay (technical) climbing. By 1983, he had moved to Salt Lake City and was working at Holubar, a mountaineering equipment store, which later became a retail location for The North Face outdoor product business. Anker continues his long connection with the company and currently serves as captain of The North Face elite climbing team it sponsors.



Conrad Anker

After gaining Utah residency, Anker enrolled at the U. (He laughingly says his mother claims he chose the U because there were mountains on the student recruitment brochure.) In addition to his studies, he worked part time at Campus Outdoor Recreation. He received a bachelor's degree in recreation and leisure from what is now the Department of Parks, Recreation and Tourism in the College of Health, one of the leading programs of its type in the country.

Today Anker serves on the boards of the Conservation Alliance, the Rowell Fund for Tibet, and the Alex Lowe Charitable Foundation. He says his involvement with these organizations is rewarding and is among the most important work he does. "It feels good to be able to give back to our community of humans and to the natural world."

On January 22 2015, the night of *Meru*'s premiere at Sundance, Anker wrote on his Facebook page, "Deep gratitude to Jimmy Chin and Renan Ozturk for believing in the possibility. One is only as strong as the team, and you two are solid. It took us two trips to touch a transitory tip of snow. Why do we do this, and what are we seeking? And to my family—your patience and support is the foundation of my life."

In the film, commenting on what it was like to reach the summit, Anker says, "*Meru* is the culmination of all I've done and all I've wanted to do. It was a fitting day, a day that I will always remember. A day that marked 25 years of obsession, eight years of trying, and three expeditions—a day that three friends shared a journey of self-discovery."

When asked what's next for him—how do you top summiting Meru?—Anker responds without hesitation, "My next challenge is one I'm working on with Jenni—to get our boys through college!"

—Ann Floor is an associate editor of Continuum.

1980s

Moises DelToro III BME'87, rear admiral, is the new commander of the Naval Undersea Warfare Center in Newport, Rhode Island, a full-spectrum research, development, and fleet support center for submarines, autonomous underwater systems, and offensive and defensive weapons systems. With more than 4,700 employees, the command provides the Navy's core technical capability for the integration of weapons, combat, and ship systems into undersea vehicles. DelToro previously commanded the *USS Rhode Island* from 2005 to 2008; served as executive officer aboard the *USS Salt Lake City*; and worked at Navy Recruiting Command, among other duties.

In addition to his bachelor's degree in mechanical engineering from the U, he holds master's degrees in engineering management from the Catholic University and in resourcing national security strategy from the Industrial College of the Armed Forces.

Olene Walker PhD'87, who served as Utah's first and only female governor, and the only person with a doctorate yet to hold the office in Utah, received the YWCA of Utah's Mary Schubach McCarthey Lifetime Achievement Award in late September.

Holding a master's degree from Stanford and her doctorate in education from the U, Walker was a member of the Utah House of Representatives between 1981 and 1989, including a term as majority whip, and served a decade as lieutenant governor, chairing the Healthcare Reform Task Force, which established the Children's Health Insurance Program (CHIP). She became governor in 2003, at the age of 72. She was also founder and director of the Salt Lake Education Foundation and has been a strong advocate for children's literacy.

1990s

Bridget Romano BS'90 JD'94 *(magna cum laude)* has been named chief civil deputy in the Office of the Utah Attorney General. Romano had served since 2011 as solicitor general, civil appeals director, and chief appellate advocate for Utah. In her new capacity, she oversees the education, environment and health, highways and utilities, litigation, natural resources, state agency counsel, and tax and financial services divisions.

Romano has been with the attorney general's office since 1996, leaving for two short periods to work in private practice. Prior to her new position, she served as chair of the Utah State Bar Appellate Practice Section, and was on the Utah Supreme Court's Appellate Rules Advisory Committee.

Romano is now second only to **Jan Graham** MS'77 JD'80, former attorney general, as the highest ranking woman in the history of the Utah attorney general's office.

2000s

Shigeki Watanabe BA'04 PhD'13, a postdoctoral fellow in biology at the U, developed a "flash-and-freeze" method of watching neurons releasing neurotransmitters. As a result, he became the first person to win the two major prizes for neuroscience and cell biology postdocs.

In September, Watanabe was named 2015 Grand Prize Winner of the $25,000 Eppendorf & Science Prize for Neurobiology. Earlier in the year, the American Society for Cell Biology named him recipient of its Bernfield Award. He also garnered a third honor in 2015—the German Physiological Society's Emil du Bois-Reymond Prize. Watanabe is a postdoc at both the U and at Charité University Hospital in Berlin. He conducted his prize-winning research in collaboration with U biology professor **Erik Jorgensen**, an investigator with the Howard Hughes Medical Institute.

U CHAPTER LEADERS SHARE IDEAS AND CONNECT

Seventeen University of Utah alumni chapter leaders from across the country gathered with Alumni Association staff on campus on October 16 and 17 to get to know one another better, share knowledge and ideas about chapter organization and activities, and strengthen connections with the U.

Those attending this year's Chapter Leadership Seminar included **Gary Pedersen** BA'98 (Arizona), **Riley Smith** BS'06 (Bay Area), **Shawn Solberg** BS'08 (Boise), **Amity James** BA'02 (Chicago), **Brian Chesnut** BS'11 MAcc'12 (Dallas/Fort Worth), **Blake Rodee** BS'02 (Dallas/Fort Worth), **Mike Homma** BS'85 (Houston), **Michael Yeh** BS'14 (Houston), **Scott Brown** BS'98 MAr'00 (Las Vegas), **Donna Lochhead** (Los Angeles), **Sean Reichert** BS'09 (New England), **Chris Linton** HBS'07 (New York), **Richard Masson** BS'94 JD'98 (Orange County), **Brooke Lowe** BS'95 (Portland), **Carol Hagey** BS'83 (San Diego), **Rickey Dana** BS'07 (Washington, D.C.) and **Brandon Lee** BA'05 BS'05 (Washington, D.C.). First held in 2006, the seminar has been held every other year since 2011, and all but three of the current 17 alumni chapters were represented this fall.

During the two days, the group discussed various chapter activities and programs—scholarships, alumni events, membership drives, student recruitment—and heard from university representatives including **Julie Swaner** BA'69 PhD'11 and **Brian Burton** from Career Services (on both resources for alumni and ways to give back through student internships), and **Mary Parker** and **Matt Lopez** from the Student Recruitment Office.

The group also had an opportunity to tour the impressive new Jon M. and Karen Huntsman Basketball Facility and topped off their visit by attending the Utah football game against Arizona State. The chapter officers returned to their respective cities with renewed dedication to exploring fun and fulfilling ways of reaching out to alumni and friends.

SAVE THE DATE FOR FOUNDERS DAY 2016

The University of Utah Alumni Association will hold its annual Founders Day Banquet on March 3 at the Little America Hotel to recognize an exceptional honorary alumnus and four outstanding graduates of the U who are receiving 2016 Founders Day Awards. A scholarship recipient also will be recognized.

The 2016 Distinguished Alumni Award honorees are **Deneece Huftalin** BS'84 PhD'06, **Pat Jones** BS'93, **Fred P. Lewis** PhD'79, and **Harris A. Simmons** BA'77. The 2016 Honorary Alumnus is **Marion A. Willey**. The scholarship winner will be announced later. (Read more about the awardees in the upcoming Spring 2016 issue of *Continuum*.) To RSVP for the banquet, go online to *www.alumni.utah.edu/foundersday*.

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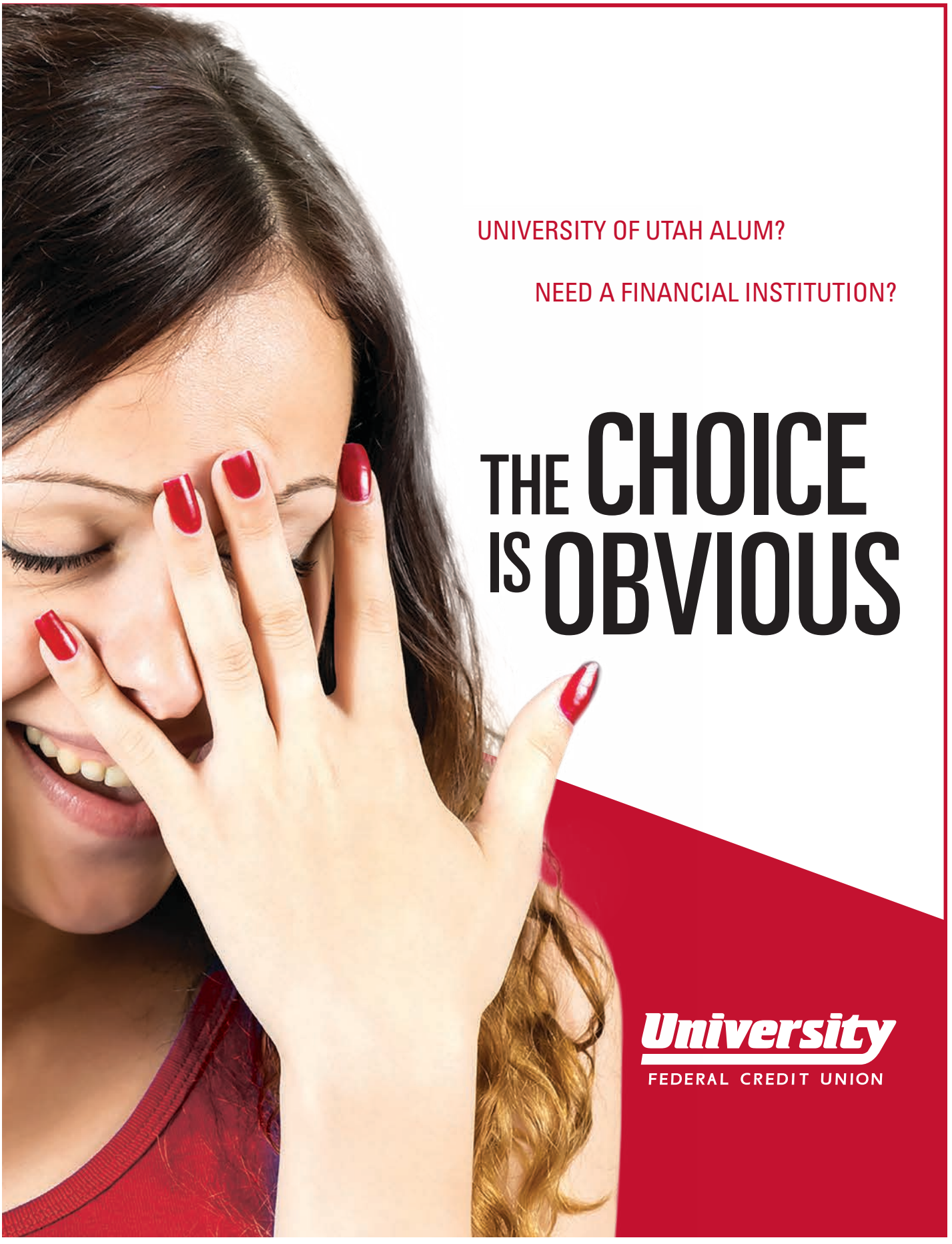
Elevated Play

The University of Utah has a brand new intramural playfield—atop the new Central Parking Garage west of the Huntsman Center. The U's first rooftop field, it will host about 230 soccer and flag football games each year. A 10- to 20-foot net surrounds the field (higher at each end), keeping both players and equipment safe, and it is only the second intramural field on campus with lights. "I like playing under the lights and on top of the garage, because it feels like we're playing in our own intramural stadium," says Alekh Chapman, a freshman studying film and an intramural soccer player. Intramural fields have been lost to recent building projects, including the Lassonde Studios and the Sorenson Arts and Education Complex, yet intramural and sport club programs continue to grow. Not only does the new field utilize what would have been wasted space, but the lighting allows the programs to run into the evenings, when students are more available, and the artificial turf allows the field to be used during moderately inclement weather. University administration invested an extra $800,000 to build the parking structure with a reinforced roof so it could support the playfield, and the University Federal Credit Union generously contributed the naming-level gift in support of the field.

Visit continuum.utah.edu *to view a short flyover video of the field in action.*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