

Winter 2017

## Utah State Magazine, Winter 2017

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# UTAHSTATE

WINTER 2017

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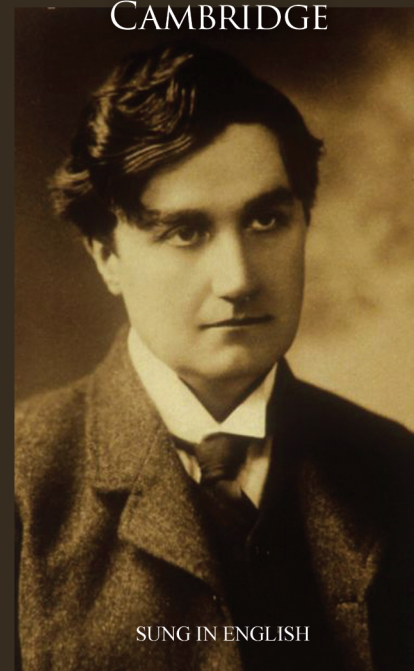
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#### ABOUT THE COVER

It is midnight in mid-summer on the North Slope of Alaska. Presidential Doctorate Research Fellow Tyler King and Bethany Neilson, assistant director of the Utah Water Research Laboratory, collect data from the Kuparuk River. Photo by Austin Jensen.



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# WILL YOU *Join Us?*

(One-sided conversations  
are *never* fun.)

We at *Utah State* magazine love hearing from readers. When we reinstituted our email version of the magazine, we received half a dozen responses. All thanked us and encouraged us to keep them coming. Allan Gross, who graduated from Utah State in 1969, told us a lot in just four words: "Excellent. Keep me informed."

*We are committed to doing just that.*



Our feature chronicling the journey of Forrest and Annalisa Purser in their struggles leading up to Forrest finally receiving a life-saving transplant, struck a chord. Annalisa said she heard from many friends and readers of the magazine since the story was

published. "There are many Aggies in the transplant community, it turns out," she said. Joe and Vicki Blanch knew the Pursers as USU undergraduates, but had lost track of them. "We are so very excited to know that he FINALLY received his transplant and is doing so well." They wanted to reconnect.

And doesn't that say it all? What is *Utah State* magazine if not a way to reconnect with friends and mentors?

We strive for excellence, keeping readers informed, and making connections along the way. Part of that involves hearing back from you. For that reason, we are reinstituting a letters section in the magazine and very much welcome you to join us in the conversation.

And speaking of joining us, we welcome Utah State magazine's new managing editor, **Kristen Munson**. This Tufts University graduate is not new to USU. She previously launched and managed our stellar sister publication *Liberalis*, from the USU College of Humanities and Social Sciences.

At the same time, we tip our hat to **Jared Thayne**, who left in the spring to pursue other professional interests, and to **Holly Broome-Hyer**, retiring this month after 32 years. Jared, a masterful storyteller, guided the magazine as managing editor for 11 years. As our art director, Holly skillfully brought 92 issues of the magazine to life from its very beginning 23 years ago. Their work speaks for itself.

Now we'd love to hear from you. Please drop us a line at: [mageditor@usu](mailto:mageditor@usu)

John DeVilbiss

Executive Editor, *Utah State* magazine



# AGGIE *Social Life*



President Noelle Cockett tries to reach students where they are. Sometimes it's face-to-face on the Quad, and lately, it's online. Starting this fall, she began holding monthly broadcasts on Instagram Live to field questions from Aggies wherever they may be.

During her first live-stream Cockett welcomed students back to campus with a special message. "Come and meet people from across campus," she said. "I would say that's probably what I am most promoting this semester: Reach out to people that you may not know and connect with fellow Aggies and make some new friends. We really want everyone that is here on campus, whether it's in Logan or across the state at one of our regional campuses, to feel part of the Aggie family."

Cockett does not shy away from difficult conversations during these sessions. Most recently, she shared results from a campus climate survey conducted to examine safety on campus and explained where students should go if they ever need help. (See page 5 for details.) The Instagram Live sessions also cover lighter topics, too. Cockett has fielded questions about her status as a True Aggie (yes!) and her role as the university's first female president (a dream!).



## **Why did you want to become USU president?**

The funny thing was I actually didn't. I started as provost, which is over the academic side of the university, three years ago. That was just a fantastic job. I worked a lot with department heads, deans, and faculty, but not so much with students. When Stan Albrecht announced he was stepping down I was encouraged to apply for the job, but had never really aspired to be president. But when I started preparing for the interview and the application process I started really getting excited about being in this position. It made me realize that one of the best things a president can do is welcome people to the university — new students, people that don't even know USU, faculty, and alumni. USU is such an easy place to love that it is has just been an absolute dream job.

## **What advice do you have for women in leadership roles?**

That's actually something I love talking about. I can tell you that Utah State and many other environments are really coming to recognize that women provide a special outlook, a special approach to leadership. My advice to women is very simple: Get involved and let people know that you want to engage in leadership activities. We've been able to get more opportunities for both faculty and students members interested in leadership. I am also interested in mentoring people. Let me know, and let others know, that you are interested in leadership and we will find something for you.

President Noelle Cockett interviewed arts student Aaron Vera during her October 30 Instagram Live event at the new Newel and Jean Daines Concert Hall. The concert hall opened during the 50th Anniversary Gala at the Chase Fine Arts Center in October. Seating capacity is more than 1,700. Classes will be held there starting in the spring. "It's been a really awesome transformation to watch," Vera said. "As a student it's always exciting to have new places to play, especially when it looks like this."



## Born to be wild

Seven orphaned black bears found temporary respite at the National Wildlife Research Center in Millville this summer where wildlife biologists monitored the cubs using a live broadcast. The feed went viral as viewers across the state logged on to watch the cubs do what bear cubs do: eat, sleep, climb, and play.

“We really try to limit our contact with them,” said Julie Young, PhD ‘06, assistant professor of wildlife resources. “But the camera also gives the public a chance to learn about bear behavior.”

Without human intervention, the cubs would not likely survive in the wild since many are still nursing when they arrive. The research station serves as a rehabilitation site for the cubs and an opportunity for scholars to study bear behavior and potential human conflicts.

“You’ve heard the saying ‘a fed bear is a dead bear?’” Young asked.

That’s not necessarily true. Utah State researchers have examined how bears behave in captivity and if it affects their roaming patterns upon release. Previous cubs rehabilitated at the site have been released wearing GPS collars and tracked over time. The bears have successfully denned over winter and don’t seek out populated regions.

“They want to be wild,” Young said.



Photo courtesy of  
National Wildlife  
Research Center

## Utah university presidents speak with one voice

President Noelle Cockett joined nine other Utah university presidents urging Utah’s congressional members to pursue a long-term solution to changes to the Deferred Action for Childhood Arrivals (DACA) program. The leaders submitted a joint letter announcing their support of a lasting legislative solution so students can continue contributing to their communities, workplaces, and classrooms.

## Students show new real estate program’s promise

18.31 percent. That was the return on investment over a yearlong real estate investment competition for five Jon M. Huntsman School of Business students. The team placed third in a national competition, ahead of Harvard and Brigham Young University, at the 2016 Real Confidence University Challenge. The annual competition allocates \$1 billion in theoretical capital among a variety of commercial real estate investment opportunities.

## USU professor joins new state advisory council

Kelsey Hall, assistant professor of agricultural communication, was appointed to Utah’s first Local Food Advisory Council created during the 2017 general legislative session. The 13-member council comprises farmers, ranchers, legislators, and agriculture experts to help build a local food economy, boost the vitality of foster family-owned farms, stimulate economic development, and preserve open space.



## A use for carrion flies

Yes, you read that right.

Utah State University Ecology Center professors Torrey Rodgers and Karen Kapheim recently tested a new technique for detecting mammals in the wild: trapping carrion flies, pulverizing the remains into a paste, and analyzing the DNA signatures of animals found in the samples. In other words, what was lunch for the flies is critical data for scientists measuring biodiversity.

The researchers deployed the method while working at the Smithsonian Tropical Research Institute (STRI) in Panama and found it out-performed traditional surveying methods such as hidden cameras and transect counts used to tally wildlife in a region. The genetic material in the fly paste revealed DNA from 20 mammal species such as monkeys, sloths, marsupials, and bats — 7 more species than transect counts, and 3 more than cameras.

“We are excited to report that metabarcoding of carrion flies is a very effective way to survey mammal communities,” said Rodgers. “We hope that in the future, this technique can aid in the fight to protect and monitor biodiversity worldwide.”

## Campus Safety: By the Numbers

In April, the university conducted a campus climate survey on sexual misconduct to gauge student attitudes about, and experiences with, nonconsensual sexual contact to understand the barriers for reporting sexual assault and to identify opportunities for improvement.

**10,502** valid responses  
a **45** percent response rate

**93** percent feel  
safe on campus

**7** percent report  
experiencing nonconsensual  
sexual contact since enrolling  
at USU

**76** percent say USU would take a  
report about sexual misconduct seriously

**5** percent filed a  
formal complaint

Nearly **90** percent of incidents  
said the assailant was someone they knew

This fall, the university launched “Upstanding: Stepping Up to Prevent Violence in Utah,” a bystander intervention program developed by the Utah Department of Health, and began requiring all incoming students to complete an online sexual assault awareness course. The university is working to make it easier for students to find out where and how to get help should they ever need it. Utah State is also examining the formal complaint process and created a working group to revisit and streamline campus policies for handling sexual assault complaints. The measure should be completed by spring semester 2018.

## Examining Utah's Opioid Crisis

Nearly every day, someone in Utah dies from an opioid-related overdose — a fact that prompted reporters from Utah Public Radio to research a new original series “A State of Addiction: Utah's Opioid Epidemic.” The 13-part series began airing in October and will run through December.

The series examines what is being done to combat Utah's opioid crisis and uncovers some potential pathways forward for people and communities struggling with this addiction. UPR traveled to USU Eastern and USU-Vernal to encourage frank conversations about this urgent public health problem. Coverage was made possible through a grant from the Association for Utah Community Health.

Illustration by Sally Stocker

## LAEP design garners top honors

A team of Landscape Architecture and Environmental Planning students drafted plans to convert the Hinckley Ranch, located in Ogden Valley, into a center for equine therapy and community gatherings. The Hinckley Ranch Mountain Ability Center project received high praise from the American Planning Association Utah Chapter for being an outstanding student project.

# THE BUCKET

WHAT DO YOU DO WITH WOUNDS THAT ACCUMULATE BUT NEVER SCAR? FOR JENNIFER SINOR, PROFESSOR OF ENGLISH, YOU HOLD OLD HURTS UP TO THE LIGHT AND SEE WHAT YOU CAN MAKE OF THEM. HER MEMOIR *ORDINARY TRAUMA*, PUBLISHED BY THE UNIVERSITY OF UTAH PRESS, USES A SERIES OF FLASH NONFICTION ESSAYS TO REVISIT THE EVERYDAY HARMS SHE EXPERIENCED GROWING UP IN MOTION BETWEEN MILITARY BASES. "WITH MEMOIR, YOU'RE LOOKING AT YOUR LIFE AND FIGURING OUT THE 'SO WHAT?' OF IT," SINOR SAID. "YOU'RE LOOKING FOR THE MEANING AND THE THEMES. MEMOIR IS NOT A CHRONOLOGICAL TELLING OF THE PAST. IT'S TAKING THE TRUTH OF THE PAST AND BENDING IT. AND THE BENDING OF IT TELLS YOU WHO YOU ARE." SHE IS THE ONE NOT CHOSEN. THE DAUGHTER CONSUMED BY LOSS. A PERSON WHO HOARDS MOVING BOXES FOR JUST IN CASE. SINOR IS ALSO A SURVIVOR. —KM

## THE BUCKET

Late April 1969. For the past few weeks, purple spiderwort and phlox have begun to appear along the cactus-rimmed roads of Kingsville, Texas, a naval town. The flowers have risen open-faced and ready after a short, mild winter, one noticeable only to the locals. Within several months, somewhere in the hot middle of summer, the roads will fill with June bugs the size of small mammals. Those who have lived in Kingsville for at least one summer already know that when driving these June-bugged roads, they need to turn the radio up to drown the sound of bodies crunching beneath the tires. But this comes later. Now it is spring. And in rhythm with the rest of the natural world, the obstetrics ward of the Kingsville County Hospital is filled with women giving birth.

A man hurries into a waiting room. Tree-tall and just as narrow, he wears a dark suit with a thin, black tie. The fluorescent lighting draws out the red in his hair, setting the crown aflame. Not stopping at the registration desk or to check the hospital floor plan posted near the elevator, he moves through the halls with the precision of a surgeon. It is his second visit to the hospital that day. Only a few hours before, having made sure his wife was safely in the hands of the doctors, he had rushed home to shower, shave, and change from his jeans and t-shirt. When his first child came into the world, he wanted to be wearing a suit. Now, shaving cream still clinging to the lobes of his long ears, he returns, suited, and finds a place in the waiting room with the other fathers. The total trip has taken only a little over an hour. What he doesn't know is that the waiting has just begun.





Painting of Jennifer Sinor created by  
USU student and artist Marissa Lords.



“When his first child came into the world,  
he wanted to be wearing a suit.”

Hours later, the young man still sits in the windowless room of the Kingsville County Hospital, shaving cream wiped from his ears. Nurses flit by offering the occasional cup of coffee or a few words of encouragement. Once or twice they assure him the doctor will be out to see him soon. But still he waits.

Other new fathers have appeared and disappeared throughout the afternoon, passing out cigars as a way to feel a part of things. Cheap tobacco presses against his chest. A man used to being in charge, only recently released from his tour of duty in Vietnam where he had served as a legal advisor, he does not wait well. He also has an innate distrust of doctors, perhaps because they possess a knowledge that he does not. All afternoon he has struggled with himself not to move beyond the swinging doors and take the scalpel into his own hands. While he has delivered calves and colts as a young boy on his family's farm in Nebraska, he knows nothing about delivering a baby. Even given his own ignorance, though, he realizes that a wait this long is not good. The next time a nurse walks by, he tells himself, he will demand to see the doctor.

He considers calling his parents who still live in Cozad, Nebraska, but decides against it. Long distance is expensive; only bad news justifies the cost. Because he and his wife haven't lived in Kingsville long enough to make the kind of friends who appear at the hospital with brown paper bags full of food, he rarely looks up when someone enters the room. Instead, he rereads *National Geographic*. Occasionally he walks to the nursery to make sure his first child hasn't arrived in this world without his knowledge. The same babies sleep there every time, bound tightly in hospital blankets. As afternoon pushes into evening, he stops imagining what his child might look like.

The doctor arrives. He bursts into the waiting room, having not even taken the

time to change his blood-soaked scrubs. Sweating and out of breath, it is as if the doctor has been the one in labor. The young man—stunned by the material fact of his wife's blood—finds himself rehearsing over and over the patterns created by the mint-green fabric and dried blood on the doctor's smock. Clouds, flowers, buildings, snakes. At least here is something he can hold onto. Because of the sweating and the breathing and the general chaos the doctor brings with him into the tiny waiting room, the young man does not absorb every word the doctors says, but by highlighting the key terms he comes to understand that things have gone badly in the delivery room. So badly in fact that he must now choose to save either his wife or what could be or would have been his daughter.

The dark suit seems painfully out of place. News like this, he worries, should be met less formally. It could appear to someone on the outside, a bystander, one of the cigar-laden new fathers, that he has come to the hospital prepared to mourn.

Faced with the possibility of losing the woman that he loves, the young man chooses his wife. He lets the daughter go.

What is happening in the delivery room now that the doctor has returned with the father's decision? The doctor's patient has long been unconscious. Perhaps from the drugs, or the pain, or the loss of blood, she has slipped into a comatose state. The baby is wedged in the birth canal, doubled up, her rear end first. The doctor is not able to say for sure what has gone wrong. He reviews his decisions, questions his choices, and considers the options that remain. At moments the delivery room has been noisy and panicked. There were the pain-filled screams of the then-conscious woman, the shouted commands of the doctor, and the urgent questions from the nurses. Now, as the same doctor studies the rear end of the baby and considers how best to remove

the body, it is quiet. The baby is a test question he works to get right.

In the end, he chooses to fracture. With confidence born from a decision reached, he breaks her collarbone swiftly and in so doing severs the nerves in her neck. No longer worried about the fact that the umbilical cord has wrapped around her windpipe, denying her oxygen for long periods of time, he pulls the broken body out with forceps.

Father waiting, mother unconscious, the darkened body of the fetus is dropped into a bucket on the floor and shuttled across the linoleum into an adjoining room.

The doctor begins suturing the woman's tears.

Sometime later, the wounds almost closed, blood loss stemmed, the color returns to the woman's cheeks like sun on a field. Nurses shuffle in and out of the room, carrying trays and charts and rubber gloves and tools. Some help to stitch the woman back together at the seams; others begin to scrub the tables and floor. Sometime after six p.m. an older, green-scrubbed doctor who has recently begun his shift walks through the adjoining room and sees the bucket holding the discarded baby on the floor. At first, he does not know that it is a baby. He just sees a form. Intuition, experience, hope, or the universe nevertheless causes him to stop. He makes a choice. From what will forever be known as The Dead Baby Bucket, the doctor pulls the baby out. Though bloody and broken and blue from lack of heat and oxygen, it is breathing. The dead baby breathes.

*Jennifer Sinor is the dead baby who lived. She is also the author of Letters Like the Day: On Reading Georgia O'Keefe published earlier this year by the University of New Mexico Press.*





## FINDING HIS LINE

Utah State University Eastern, Blanding art professor Anthony Lott is the 2017 National Parks Service's Community Artist in the Park. The program was created in 2009 to highlight the connection between local artists and the inspiration they find in natural spaces. "When I am in the studio, there are times when I am really active and aggressive and then the second half is very still and methodical," said Lott. "There are those parallels with the environment where things change rapidly and then move really slowly."

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Photo courtesy of USU postdoctoral student Abhilash Kamineni.  
He traveled to Idaho with his lab to watch the total solar eclipse.



# NO ADMISSION REQUIRED

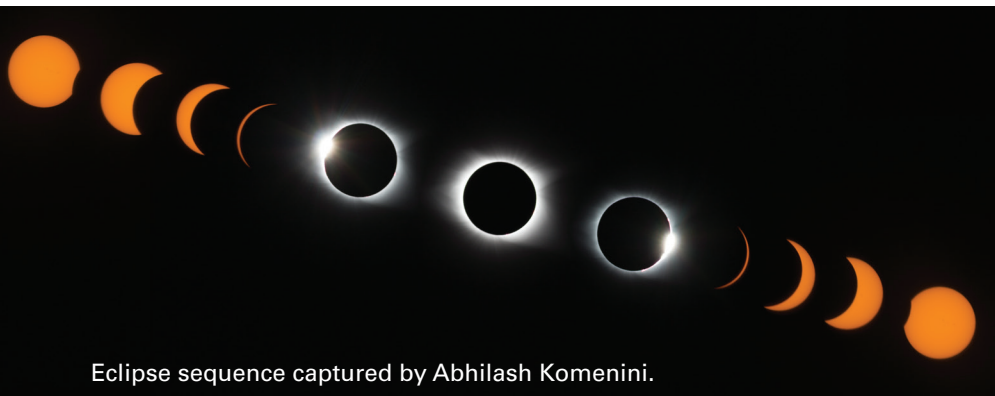
By Kristen Munson

IN LATE OCTOBER OF 1780, A YOUNG MATH PROFESSOR NAMED SAMUEL WILLIAMS, HIS 9-YEAR-OLD SON, AND A SMALL CREW OF FACULTY AND STUDENTS SAILED A 250-TON ROW GALLEY INTO BRACING, ENEMY-CONTROLLED WATERS. THE VESSEL WAS LADEN WITH ASTRONOMICAL INSTRUMENTS AND HEADED FOR A NARROW STRETCH OF OCEAN OFF THE COAST OF MAINE SO THE PASSENGERS COULD STUDY THE SKY DURING A TOTAL ECLIPSE OF THE SUN. THE EXPEDITION PUT THE AMERICAN WAR OF INDEPENDENCE ON HOLD FOR FIVE DAYS.

The mission was made possible after John Hancock wrote British commanders requesting safe passage for the astronomers: "Though we are politically enemies, yet with regard to Science it is presumable we shall not dissent from the practice of all civilized people in promoting it either in conjunction or separately," he wrote. The British agreed: the pursuit of knowledge was a worthy enough endeavor to lay down their arms — at least, for a spell.

"I think it's striking to many people today because you can't imagine us saying to North Korea, we would like to see an eclipse [in your backyard]," said Sara Schechner, a science historian and curator of the Collection of Historical Scientific Instruments at Harvard University. "It's something worth celebrating that people could set aside their political conflicts for something to benefit the public good."





Eclipse sequence captured by Abhilash Komenini.

In a sense, scientific exploration is part of the nation's DNA. The next century was punctuated with eclipse expeditions funded by Congress so uncharted territories could be mapped, new biological specimens collected, and for those few minutes when the mechanics of the universe are revealed. Humankind seemed excited to discover what we did not know.

## THE SCIENCE

The path of totality is the sliver of the planet, typically about 100 miles wide, where the moon's shadow sweeps across Earth during a total solar eclipse; it's the only spot where a person can safely stare at the sun with the naked eye. The path often falls across large tracts of open sea or uninhabited lands. Historically, solar scientists spent years planning expeditions to foreign soils to conduct experiments during totality only to be thwarted by rain or the wisp of clouds.

And yet, the opportunity to take measurements during eclipses has propelled scientists into the path of totality for centuries. During total solar eclipses, scientists have revealed the existence of elements, such as helium, that were not yet found on Earth; and they've used these predictable phenomena to upend our assumptions about space.

"My favorite expedition is the one that proved that general relativity is true," said physics major Jonh Mojica, 17. "People went to Africa during the solar eclipse [of 1919], and that was the moment people realized this guy Einstein was saying something important. Eclipse expeditions are more important than people think. It's like having a switch on the sun for moment. Turn it off and make

the measurements that you want to make at the moment."

Mojica spent the August 21, 2017 total eclipse in the lab, collecting data for his undergraduate research project with department head Jan Sojka. He used a low-budget device, built largely with recycled antennas and a small single-board computer set atop the roof of the Science Engineering Research building, to monitor changes in the ionosphere during totality. The ionosphere is part of the Earth's upper atmosphere and critical for reflecting radio waves around the planet. Typically, solar activity fluctuates throughout the day, but Mojica and Sokja wanted to see what happens during an eclipse.

"That's how the project started – as something relatively simple," Mojica said. "But when we started collecting data we realized our computer models are not as accurate as the data we are collecting. The project became even bigger because now we can use our data to fix computer models and also to predict if there are any changes on the ionosphere that will affect weather down here on the earth."

The project encapsulates why Mojica was initially drawn to physics: What begins with one question is often bigger than you expected. And the questions that first captured Mojica's attention while attending an English immersion program at Utah State in 2012 — *What is space? What is time? What is our purpose?* — continue to motivate his studies.

"It wasn't long ago that we realized the universe is bigger than we think," Mojica said. "Even in the early 1900s people still thought the biggest the universe could possibly get is this galaxy. Often when I go home [to the Dominican Republic] I tell students from my high

school, 'Physics is not for smart people. It's just for people who are curious — who want to know how things happen, why things happen.'"

## THE BEAUTY

Curiosity is part of what drove physics professor Boyd Edwards on a hunt this summer to buy 56 pairs of eclipse glasses for friends and family members and to build a pinhole camera for his grandson. Curiosity is part of what spurred him and his loved ones to drive north and pay \$30 a vehicle for the chance to stand in a farmer's alfalfa field and look up. But it's just a piece of the story.

In the days before the eclipse, Edwards was in his office at Utah State when his wife called. She had just spoken with his mother: "She's not going to miss the eclipse," his wife relayed. Edwards hung up the phone and smiled. The chance to experience totality doesn't happen every day or even every lifetime. Solar eclipses occur in predictable cycles about every 18 months, but it takes about 350 years for totality to occur in the same place on the planet.

"Astronomy is really a learning hobby," Edwards said.

You fiddle with the aperture of a machine and examine the effect. You see a cloud of fuzzy light and wonder "What am I looking at? How far away is it? What is it made of?" Whenever Edwards teaches astronomy, he requires students to close their textbooks and go outside to explore the heavens with their own eyes.

"It's the combination of wonder plus learning," Edwards said. "But learning can often drive the wonder."

Edwards quotes 19th century theoretical physicist Henri Poincaré to underscore his point: "*The scientist does not study nature because it is useful; he studies it because he delights in it, and he delights in it because it is beautiful.*" That's the essence of why I am a scientist. You can ask everyone in this hall about why they're a scientist and probably get a different answer. For me, it's about delight. It's about beauty. It's about art."





USU students view the August 21, 2017 eclipse from the Quad. Viewers in Cache Valley witnessed a partial eclipse since it was located outside the path of totality. Photo by university photographer Donna Barry.

## THE COMMUNITY

Wondering about the night sky is an everyday part of James Coburn's life. Since 2000 he has managed the USU Observatory. Getting people to look up is his job. But it's also his passion. While still an undergraduate at Utah State, Coburn, '93, MS '98, helped run the observatory and distinctly recalls the moment he knew he would pursue a career in physics education.

"One night I was showing people Saturn and they were like 'Wow!' You've seen pictures of Saturn all of your life, but looking through the telescope it's real," he said. "That night I was driving home thinking, 'I like that. That was fun. I'd like to do that.' I got into this because of the enthusiasm people have when they get to see something for themselves."

That's why he led two dozen Utah State staff, students, and friends to Rigby, Idaho, to stand in the path of totality this summer.

"I started thinking about where can I go to watch it? Why don't I go with telescopes and make it nice for me and for other people?" Coburn said. "There's no admission to our telescopes. People can ask questions and look at things they won't be able to see otherwise."

Area campsites sold out more than a year in advance of the eclipse and available hotel rooms listed for upwards of \$900. Some entrepreneurial farmers and homeowners even rented out portions of their fields to eclipse chasers. Rebecca Squires, '98, the Jefferson County coordinator for emergency management, helped Coburn secure a campsite for the USU eclipse team to conduct original research and house telescopes for public viewings. Growing up in eastern Idaho, she remembers staring into a pinhole camera as a kindergartner and watching a partial eclipse of the sun. The next total eclipse nearby would be 2017 her teacher said.

"I remember thinking, 'I'll be old!'" Squires laughed.

She never imagined she'd be responsible for planning for it. Squires spent months trying to anticipate the challenges that come when an event like the Great American Eclipse is predicted to triple the population in a region.

"It's a cultural event. It's a commerce event. But it's also an event that requires emergency planning," Squires said. "How do we prepare for it? How do we recover from it?"

One community member rented out space on his butte for 1,000 campers from 19 countries and 39 states, she said. "That's the beauty of it and the magic of it. We live in such a turbulent time where you're not sure what the beliefs are of the person standing next to you. But last night people's kids were playing together; it was such a beautiful thing to see. We're all here for the same reason. This event is bringing us together at a time when so many things are tearing us apart."





Where is our place in the stars? In mid-day darkness in the center of the Tetons. John DeVilbiss photo with Jill and Edie DeVilbiss and Jane Hiatt.

## THE ECLIPSE

The morning of the eclipse, campers in Rigby unzipped their tents, scanned the sky for clouds, and checked the weather on their phones. Three more hours before the sun goes black.

The Utah State eclipse team assembled 12 telescopes on a patch of grass near their tents. Peter Haugen, a doctoral student in physics, punched in the coordinates for a telescope to track the sun during totality. Passersby paused to take turns peering into the telescopes to see sunspots the shape of Hawaii dotting sun's surface. "Are you sure they aren't dust?" a woman asked.

"Those spots are about the size of our planet," Haugen assured her — they just look incredibly small and insignificant.

Utah State physicists Mike Taylor and Yucheng Zhao peeled foil from the Advanced Mesospheric Temperature Mapper, an infrared camera Taylor helped develop to study acoustic gravity waves in the upper atmosphere. The camera is primarily deployed at night to photograph images of these long frequency waves, but today it will test conditions during totality. It's experimental, unfunded research designed to gather a taste of the conditions in the mesosphere and write propos-

als for future balloon experiments, Taylor said. "The eclipse will give us a portal into the upper atmosphere."

Taylor is the principal investigator of a new NASA grant aimed at developing a concept of study for an advanced infrared temperature mapper to fly aboard the International Space Station.

"As long as it works I'm happy," he said, referencing the eclipse experiment. "As long as it's not cloudy. As long as we get some data."

The enormity of the camera attracts campers from across the park. Taylor explains the purpose of the experiment to a filmmaker for his YouTube channel as children stare at laptop screens Zhao toggles between while testing the equipment. The children jump over electrical cords powering cameras collecting data from 50 miles above where they stand.

"I like to think you've got three types of scientists," Haugen said. "You've got the trailblazers like Mike and Yuchen who figure out new territories and new land [for exploration]. Then you've got the gardeners, those are the teachers, who show others the tracks and how to find them. And then you've got the tour guides who explain why it all matters. They are all parts of the tripod that support the whole system. I've been more of a gardener and a tour guide, but I'll get on the trail soon enough."

At 10:16 a.m., Coburn announces he sees a flat spot on the sun. Eclipse glasses go on and the campers confirm, yes, a tiny chip of the sun appears to have vanished. An hour later daylight fades to dusk, the temperature drops, and sweatshirts emerge. A honeybee lands on a notepad as if confused. Suddenly, a cheer erupts across the campground as the moon's shadow approaches. A night hawk flies overhead. Totality arrives and eclipse glasses come off. Hundreds of people stare at the sun — a giant black ball breathing in the sky.

"Don't look," Taylor yells two minutes later as the first sliver of sun reappears.

Venus fades. Daylight returns. Work to disassemble the camera commences.

"We got some data," Taylor smiled. "I don't know what it's like yet, but we got some data."





Starting next fall the USU Hunger Institute will offer a seminar course on hunger issues and a minor in hunger studies. Photo by Donna Barry.

# TOO hungry TO LEARN?

TIRED. ACHY MUSCLES. AND “FOGGY BRAINED.”

That’s how students typically describe their symptoms to Beth Booton, a nurse practitioner at Student Health Services, when they come in feeling sick. She asks about their diet and collects a blood sample. Sure enough, when the results come back from the lab they are often as she suspected: nutritional deficiencies.

“Students are on a budget,” Booton says. “Many tell me they can’t afford fruits and vegetables. It’s not like they are starving, but poor-quality foods can cause insulin resistance. I often will refer them to SNAC (the food pantry on campus) — sometimes it’s that they don’t understand their options.”

This is food insecurity.

The U.S. Department of Agriculture defines it as not having sufficient access to nutritionally adequate and safe foods every day. Nationwide, food insecurity affects about 12 percent of Americans, and some reports suggest college students may be a particularly vulnerable — and understudied — population. Estimates indicate more than one in five college students experience the type of insecurity that involves not eating for a day or more, the type of hunger sated with a glass of water before bed to feel full.

By Kristen Munson





Caleb Harrison and Heidi LeBlanc are developing the USU Hunger Institute to tackle issues of food insecurity on campus and beyond. Photo by Donna Barry.

Food and housing  
are usually the first essential  
things to go.

Many people assume  
that if you can afford college,  
you can afford food.”

Caleb Harrison, '17, wants to know how prevalent food insecurity is among Utah State University students so he's generating the data to find out. Harrison is behind a year-long study examining food insecurity on campus, and part of a broader effort to address hunger issues statewide.

“I think [the problem] is bigger than we think it is,” he said. “In most cases there isn't a safety net that students can turn to. Students almost never qualify for the Supplemental Nutrition Assistance Program (SNAP). Food and housing are usually the first essential things to go. Many people assume that if you can afford college, you can afford food.”

Harrison was hired to create the USU Hunger Institute, a new center envisioned to develop models of best

practice that reduce food insecurity and can be replicated across the state. The goal is to connect researchers already examining various facets of the problem from departments across campus such as public health, economics, and agriculture, and sync efforts to streamline inefficiencies in the food system.

“That's one of the most infuriating parts about hunger,” Harrison said. “It's not a supply problem; it's a distribution problem. Many people are working in silos at the university; we want to bring them together.”

Paperwork for developing a 501c3 was filed in September. The USU Hunger Institute is the brainchild of Heidi LeBlanc '96, MS '98, director of the state's SNAP-Ed program Food \$ense. She believes the university is uniquely positioned to tackle food insecurity because of its land-grant mission, agricultural expertise, and dissemination power through USU extension, which has a presence in every county statewide.

“There is so much you can do when you have partnerships,” LeBlanc said. “Even if you don't have funding right away, you can stretch the resources you have.”

That is LeBlanc's background. She leads the program tasked with providing

nutrition, budgeting, and food safety information to residents across the state — it's her job to teach others how to amplify constrained resources. LeBlanc argues that researchers tackling food insecurity will be more effective if they collaborate. In 2015, she enlisted then-USU president Stan Albrecht to sign the Presidents' Commitment to Food and Nutrition Security pledge, a global campaign that begins on college campuses aiming to end poverty and hunger worldwide.

The purpose of the USU Hunger Institute is to link programs already in place, such as USU Sustainability to help close gaps in the campus food system and build new pathways for collaboration and research. For instance, Harrison is helping jumpstart one of the first Campus Kitchen projects in the West by harnessing a workforce of student volunteers with kitchen space donated by USU Dining Services. The Campus Kitchens Project is a national program that reduces food waste and food insecurity by connecting resources. Individuals collect donated food and food recovered that would otherwise be wasted with hungry people in a community. Harrison sees dietetic students as ideal candidates for leading this effort at USU because their degrees require experience with food preparation. He envisions this workforce preparing hot meals for food insecure students and nonprofits across the community.

Food recovery efforts are already alive and well at USU. Since 2015, nearly 30,000 pounds of food have been recovered on campus. And while the SNAC food pantry provides some relief for hungry students, there are currently limits to what can be stored on the shelves. By incorporating leftover refrigerated food recovered from campus events and unsold items, such as salads and fruit parfaits made daily by Dining Services, hungry students have greater access to fresh foods. Once USU's Campus Kitchen launches, hot meals can get added to the shelves.

“I think the grassroots effort is where a lot of the movement can happen,” LeBlanc said. “It's important to do more than just talk.”





The class of 2021 lights up the Quad in Logan during the second annual Connections Luminary, a university tradition welcoming all incoming students to USU. Students each carry a luminary lantern shaped like the tower of Old Main, and participate in a processional from the Dee Glen Smith Spectrum to the USU Quad — the reverse of the route they will take at commencement. Photo by Jeremy Jensen.



Xylocopa or “carpenter bees” are one of North America’s largest genus of bees. They chisel into dead pieces of wood.

The tiny bee is in the genus Perdita.



# *A bee or not a* **BEE?**



*Apis mellifera*.  
The European  
honey bee.

By Kristen Munson

Pop quiz. How many species of bees are native to the United States? Fifty? Five hundred? A thousand? Better quadruple that figure.

A recent study published in the journal *Frontiers in Ecology and the Environment* found that although 99 percent of respondents consider bees important, most people vastly underestimate the number of native bees in the United States, and less than half of participants could identify two common bee species. In other words, for as popular as these pollinators are, most people don’t know buzz about bees. This begs an important question: how can we save what we don’t recognize?

That’s something the study’s lead author emphasizes as some native bee populations may be declining. Joseph Wilson, ’05, PhD ’10, is an evolutionary ecologist at Utah State University-Tooele. Before you can do a conservation campaign you have to know your baseline, he explained. We may need to step back and figure that piece out because successful conservation efforts require public support and the knowledge to implement them appropriately. Otherwise, efforts to “save the bees” can fall short, or even backfire.

*Bombus huntii* or “Hunts bumble bee” is common in the Intermountain West.







Anthophora are called “digger bees” because they all make their nests in the ground. They are solitary bees, with no hive, queen, or workers.



Osmia or “mason bees” often construct their nests using mud. They are excellent pollinators of orchard crops.

“Honeybees are an agricultural commodity,” Wilson said, adding that they are valuable pollinators. But they are one of about 4,000 bee species in the United States, and they are not native.

Yet, honeybees often dominate news coverage of pollinators at risk, and what works for protecting honeybees doesn’t always square with the needs of other bee species such as the rusty patched bumble bee, which was added to the Endangered Species list in March. That’s because most bee species don’t live in hives and don’t make honey. Many bee species nest in the ground or burrow into places like hollowed out twigs, sandstone walls, or even inside snail shells.

Interestingly, the Beehive State may be aptly named. More varieties of bee species exist in Utah than east of the Mississippi River, Wilson said. The desert climate, along with mountain ranges, create natural barriers for species to evolve. Some bee species are specialists and have evolved to pollinate one type of flower. Surprised? You’re not alone.

“We saw the news stories and we saw the gaps, and thought ‘Somebody should write a book’ because nobody was,” Wilson said. “It became really apparent that people don’t know anything about bees.”

So in 2016 he and fellow Aggie



Halictus ligatus or “sweat bee” named because some bees in this family land on people to drink their sweat.

Olivia Messinger Carril, ’00 MS’06, published *The Bees in Your Backyard*, an introductory guide to close the knowledge gap about native bees. The two researchers are also under contract with Princeton University Press to write an eastern and western field guide to bees in the United States to help people learn what different bees do, how to identify them, and how to save them.

That explains why these days one often finds Wilson in the field with a camera slung over one shoulder, a

collection net across the other. The camera is a valuable teaching tool for students and the public, he said. “It’s easy to see why bees are important to us. They are more unique and useful than I thought. And I think they’re cute. We say there are about 4,000 species in the United States because every time we perform a count new species are identified. It really is an adventure because you’re always finding new stuff.”

*All photos courtesy of professor Joseph Wilson, an evolutionary ecologist at USU-Tooele.*





# IN THE BALANCE

By John DeVilbiss

$P = Q + E + \Delta S$

WE NEED OUR WATER TO BE JUST RIGHT. WE DEPEND UPON THIS TO KEEP EVERYTHING ELSE IN BALANCE. JUST RIGHT IN SUITABILITY, TEMPERATURE, FLOW, AND AMOUNT. THE QUESTION THAT UTAH STATE UNIVERSITY WATER RESEARCHERS SEEM TO BE GRAPPLING WITH NOW MORE THAN EVER IS HOW TO ADJUST AND MITIGATE WHEN OUR WATER IS NOT JUST RIGHT?

Take water-choking algae, for example. Seriously, take it, says Ron Sims, and figure out how to turn it into a commodity. That is the challenge he has issued eight of his capstone students working at Utah lakes and reservoirs. Or, in Michael Johnson's case, take on an urgent challenge from desperate water officials in California to determine just how much more water can safely flow through a damaged spillway; and be aware that your conclusion impacts hundreds of thousands of lives and billions of dollars in agriculture.

Take eight summers of your life if you are Bethany Neilson wading through Arctic waters taking flow measurements and water temperatures. Or take it one day at a time, if you are Julie Kelso, determining the water quality of Utah streams. All of these researchers are looking at water through a different lens and seeing things in new ways. Literally for Mac McKee and Alfonso Torres-Rua with the help of sensors attached to AggieAir drones. McKee is the director of the Utah Water Research Laboratory (UWRL) and

Torres-Rua, is an assistant professor in water resources at the UWRL and in USU's Civil and Environmental Engineering Department.

## PRECISION WATERING

For the past four years, UWRL's drones have been flying over the vineyards of central California to capture images that ultimately help growers to increase water efficiency and crop productivity. Their data is so detailed they can geo-locate every grape row and vine. They can take that data and build three-dimensional models of vineyards, trees, roads, and





A blue-sky day, perfect for hunting blue-green algae. Students spent 12 hours in early October on Utah Lake in hopes of harvesting cyanobacteria through a vacuum filter they engineered. Their goal is to harvest enough algae to produce methane gas and bio-oil. Photo by Donna Barry.





An exact replica of the Oroville Dam built at the Utah Water Research Laboratory earlier this year is a model example of the UWRL's water research relevancy. With a damaged spillway on the country's tallest dam, California water officials turned to USU's water research laboratory for help. Photo by Matt Jensen.

Scientists eschew unpredictability, especially if lives or livelihoods are at stake.

When the middle dropped out of a spillway chute on the Oroville Dam in California last February, it left more than a few questioning the structural integrity of the country's tallest dam.

everything else, so growers can virtually walk up and down the rows from their computers.

"We can identify where every vine is and tell them where every dead one is and how many there are," McKee says. "We can tell them precisely where each vine is within inches of its actual location on the ground."

Their advanced remote imaging allows them to pinpoint the amount of water each plant is absorbing from the soil and how much replenishment the plant needs through irrigation. With global weather swings on the increase, being able to manage water accurately in time of drought and flood requires a new level of sophistication that UWRL's remote sensing and big data provides. The timing is critical. This year California saw both record rainfall and heat, exacerbating fire conditions in Sonoma County where deadly blazes approached within five miles of UWRL-monitored vineyards.

Torres-Rua, a native of Peru, chose USU specifically for its groundbreaking expertise in irrigation engineering, and that led him to remote sensing science. He not only wanted to understand more fully the spatial differences between one farm field and another, but also every square foot within the same field. As a young boy, he says he used to wonder

why the real world was not composed of cubes and squares like the worlds depicted in video games. As it happens, in remote sensing, that is exactly how the real world is defined. He is living in that world every time he combs through the cubed pixels of data of post-flight images.

## A PUZZLING HYDROLOGY

It is more like ice cubes that dominate Bethany Neilson's world. She is

the assistant director of UWRL and an associate professor in USU's Civil and Environmental Engineering Department. From childhood, she has always been fixated on wanting to know how things worked and why. She was so persistent, at times, that some considered her a difficult child. "I guess things needed to make sense to me," she says.

Today things still do need to make sense, and although the focus of her questions has changed since childhood, she still needs to know why things work the way they do. Stream temperature dynamics, for example, have kept her puzzling for years. She started her studies in the desert of southern Utah and then extended it to the deserts of the Arctic. She learned how groundwater interfaces with the landscape in warm regions and wanted to know how it behaves in cold ones. That led her to a lonely field station in the Arctic — an arduous nine-hour drive from Fairbanks, Alaska.

"I was just going to go up there and figure it out," she says. That was in 2009, and she's still trying.

It turns out that Arctic hydrology is a lot more complicated than what she first thought. Yes, everything is frozen solid as you would expect in the winter, but in spring when things begin to warm up, "Kaboom, everything runs off." But



not like a pipe. No river is. The water actually flows in and out of the sediments and, in the process, interacts with frozen soils below that creates a cold boundary condition hidden from the 24-hour Arctic sun.

Despite the low streamflow during dry summer periods and the constant sunlight, the rivers are buffered, meaning you don't have these huge daily fluctuations of temperatures that you would expect. This buffering effect helps to keep river temperatures down to safe levels for fish and other aquatic life. As the planet continues to warm, this unique cooling system used by rivers may help prevent fish die-off. At least for now.

"The system is pretty resilient," she says. "But I don't know how long it will last."

## PROCEED WITH CONFIDENCE

Scientists eschew unpredictability, especially if lives or livelihoods are at stake. When the middle dropped out of a spillway chute on the Oroville Dam in California last February, it left more than a few questioning the structural integrity of the country's tallest dam.

While the dam itself was never under threat, the failure of the spillway was serious, says Michael Johnson. He is a research professor at the UWRL and in USU's Civil and Environmental Engineering Department. The partial loss of the flood control outlet spillway compromised an important safety valve, and right in the middle of one of California's wettest years on record, including nearly 13 inches of rain that dropped in Oroville's Feather River Basin the first week in February. With March, April, and May still looming, the California Department of Water Resources needed to know just how much more water their damaged spillway could handle if the flooding continued.

"Surprises are only good on birthdays and at Christmas," Johnson says. "We engineers are averse to risk, that's for sure."

So engineers in California turned to Johnson and other UWRL researchers for help. They knew that physical modeling is still the gold standard in projects such as these and that the UWRL had the necessary expertise. They needed the laboratory to build a replica of the failed condition of the spillway "to help them get from where they were to where they wanted to be," Johnson says.

Although the model is 50 times smaller than the actual spillway, it still takes up a lot of space in the hydraulic structures modeling building west of the UWRL. Built in just 40 days, the model is 100 feet long and about two-stories high. Walk on the model and you feel like a giant looking down on the actual spillway, including the 300-foot crater the water eroded away when it escaped the crumbling chute in February.

"Those little blocks you see at the bottom of the chute are actually 23 feet tall," Johnson says. "Under large flow releases, the water is leaping off those things and landing 500 feet away, and it's 100 feet in the air. Wouldn't you love to stand near that?"

Johnson is still capable of wonder, but not so much regarding the Oroville Dam spillway. His replica has removed all of the guesswork. That's a good thing because, unlike computer and mathematical modeling, physical modeling accounts for variables such as turbulent flow that can't be replicated exactly through numerical means. "It's just somebody's best estimate," he says.

Thanks to the UWRL, engineers and officials at Oroville can proceed with confidence as they shore up the dam over the next two years. Johnson said that even if the state sees a repeat of last year's record precipitation, he will sleep well at night, and California should too. He has run the numbers — and the water — to prove it.

## UTILIZING POLLUTION

Ron Sims and students are running water too — through a vacuum filter that his

students engineered to harvest blue-green algae. Sims is the director of the Huntsman Environmental Research Center and professor in USU's Biological Engineering Department. If this pans out, it is definitely good news for Utah, and the world, as it tries to deal with a recent phenomena, a steady increase of toxic algae on our waterways.

The problem is that excess nutrients are getting into water supplies from wastewater treatment plants and from non-point sources such as agriculture and runoff from over-fertilized lawns. All of these excess nutrients are flowing into large bodies of water, such as Utah Lake, and accumulating.

As the algae grows and dies, it sinks to the bottom, and all those nutrients remain there until the next year. When the temperature of the lake water begins to even out, usually in the spring and fall, it becomes easier for those bottom-lying nutrients to be whipped up by wind and rise to the surface and grow as algae. While green algae may not be anything you want to swim in, at least it is harmless. It is the blue-green, or cyanobacteria, that is dangerous because it can produce toxins harmful to nerves, kidneys, and livers that are capable of killing people and animals if ingested.

While global warming appears to be a link, what exactly triggers these dangerous algal blooms is still being studied. But for Sims and his students, they are on a search and recovery mission. With help from AggieAir flyovers, they hope to be able to quickly target patches of blue-green algal blooms on Scofield Reservoir. Sims challenged his students to come up with a way to extract algae on a large scale from reservoirs and lakes in Utah that they can then run through a bioreactor to produce methane gas and bio-oil, while detoxifying the toxins.

"Pollution is a resource out of place," Sims says. "We are looking at this as a resource and are asking ourselves, 'How can we harness it instead of running away from it? Instead of trying to destroy this resource, how do we get energy and products out of it? How can we utilize it?'"



In early October, his students spent 12 hours at Utah Lake attempting to put this thinly disguised resource in its place. They were there to try out their new harvester attached to a stubby pontoon boat. After several attempts and many hours of wading through cold water, they had to scrub the mission, but Sims says it is only temporary. They plan to go back again, before month's end, after the students fix a few things. He is confident they will ultimately succeed. "Persistence is the best indicator of success when you are working with bright and motivated students."

## COMMUNICATION FLOW

Julie Kelso looks at algal blooms from another perspective. She is a graduate student who works with iUTAH (innovative Urban Transitions and Aridregion Hydro-sustainability). When a lake has these blooms, and they are not being harvested to make fuel, what do we want to do about them? Do officials just want to know when they are occurring so they can tell people to stay away? That is a first step, but just articulating that message to the right people who make that decision involves many channels of communication. How well are researchers communicating their findings and what impact is it having on people in terms of valuing water?

After years of monitoring water quality on the rivers of Logan, Provo, Red Butte, and Jordan, Kelso says she now finds herself trying to communicate it to others in a meaningful way. It has been both eye-opening and a bit maddening.

"I think that's where I get frustrated with research because, at the end of the day, it may not matter how much research you do, or answer scientific questions, if people's values fundamentally are driving the policy-making decisions."

So how do you communicate research to influence public values and subsequently public policy?

It is a new frontier for Kelso. She is already honing her communication

skills as a science reporter for Utah Public Radio. Anything to help start the conversation and bring people together. She is convinced that collaboration across universities and communities is essential if we hope to manage water more wisely. She thinks the biggest impact of her research with iUTAH was the way so many people came together to look at the question of water sustainability for Utah's future.

It was not just research and social scientists; they managed to get people of all labels across the state, in all different disciplines, and not just involving USU, but all three primary research institutions in the state.

"We're trying to get away from scientists in ivy towers working by themselves, which I think will be extremely hard to overcome," she says.

Sims, who comes from an industrial background, says the trick is to change the educational paradigm to encourage more collaboration on the academic side with faculty and students working to-

gether from multiple departments across several disciplines, and then take it a step further by collaborating with industry.

"We have got to be more innovative and that is why we are world leaders in innovation," he says. "Innovation means 'come on, let's sit down and talk about ways to do both.'"

That means putting aside labels, he says. Industry is not the enemy and those who work for the environment are not on the "other side." It is a balance thing – not too much and not too little, but just right.

Just a hope? Maybe. But think of all the questions and the hope for answers that have long inspired human exploration. Spend an hour with Sims and you will believe anything is possible, even a future flavor for Aggie Ice Cream.

"How about Aggie Algae Ice Cream?" he says with a laugh. Well, maybe, just maybe.

USU scientist Alfonso Torres-Rua has developed ways for farmers and growers to see water needs of individual plants right down to their roots. Remote sensing science, one of the Utah Research Water Laboratory's specialties, makes it possible to manage water accurately in time of drought and flood. Photo by Gerry McIntyre.







Photo courtesy of Edrea Robertson.



Photo courtesy of Lionel Adams

# AFTER THE STORM

By Joshua Paulsen

OUTSIDERS OFTEN CONFUSE PAST STORMS, BUT LOCALS DON'T — THEIR MEMORIES ARE FIXTURES LIKE HIGH WATER MARKS ETCHED ON THE SHORES OF A LAKE. IN AUGUST, HURRICANE HARVEY LEVIED TORRENTIAL RAINS ACROSS THE SOUTHEAST FOR DAYS, DUMPING 9 TRILLION GALLONS OF WATER ACROSS THE HOUSTON AREA. AND ALL THE WATER HAS TO GO SOMEWHERE.

Hurricane Harvey was the first in a string of deadly hurricanes this fall, and it affected millions of people including, 1,200 Aggies in the region. Many Utah State alumni are drawn to Houston for its booming economy and I have become acquainted with many of them through my work at USU. When news broke about the devastating flooding in Houston, I immediately reached out to friends in the storm's path.

"I heard my phone's notification and thought, 'Oh no, there is another friend reporting the aftermath of Harvey,'" Fei Tang, '79, texted back. "What a surprise [to receive your message]. It encouraged me and switched my mind back to Logan."

Her message made me think. While most of us are unable to physically be there for Aggies in distress, we can share their stories and, as Fei pointed out, provide encouragement and hope. As messages streamed back from USU alumni, I was enthralled by their experiences. Many Aggies lost their homes or spent weekends helping strangers "muck out" from the wreckage. Others volunteered with Americorps, their churches, or put their talents to use creating hurricane recovery websites.

Brandon Elliott, '96, moved to Katy, Texas about two years ago. His home, like many in Houston, is on a 500-year floodplain, which requires flood insurance. That first year, El-

liott and his family witnessed a 500-year flood that brought 11 inches of water into their home.

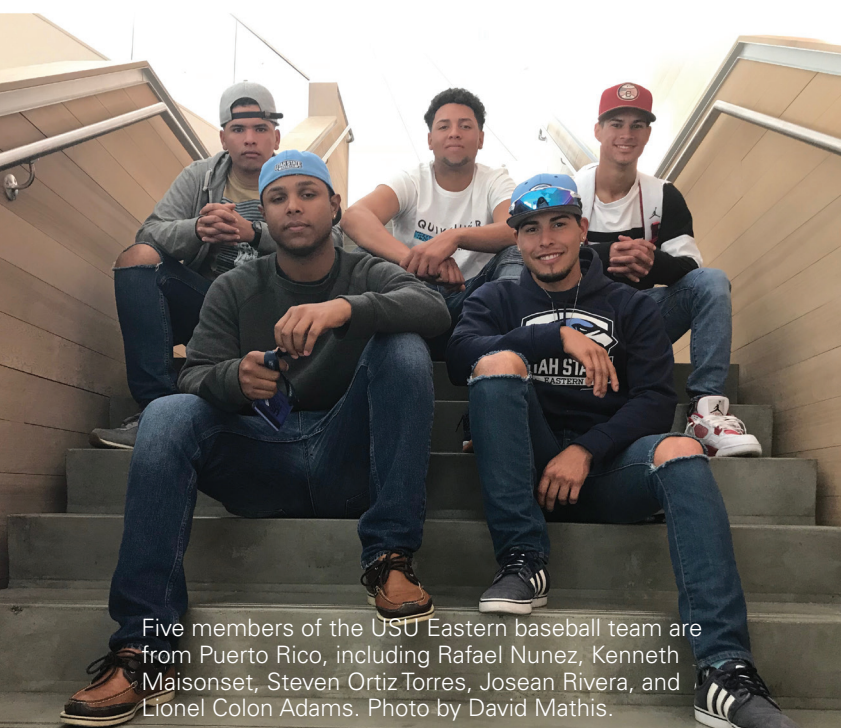
"Growing up in the mountain deserts of Heber, Utah this was a shocking welcome back to Texas," he says, noting he had previously lived in Texas.

Elliott removed the damaged furniture and drywall and, after the floodwaters receded, began building a one-foot earthen berm, an inverted moat, around his home.

"I figured that since we had our 500-year flood, this countermeasure should be sufficient for at least my lifetime," he said.

Harvey brought two feet of water to the neighborhood the next year, the equivalent of a 1,000-year flood. As the water crested the berm and inched towards his house, his family started placing furniture and valuables atop blocks. Elliott began documenting his recovery





Five members of the USU Eastern baseball team are from Puerto Rico, including Rafael Nunez, Kenneth Maisonet, Steven Ortiz Torres, Josean Rivera, and Lionel Colon Adams. Photo by David Mathis.



Puerto Rico suffered severe damage from wind and flooding after being struck by two hurricanes this fall. Photo courtesy of Lionel Adams.

efforts and posting video tutorials online to show others how to quickly, and effectively, remove drywall, mitigate mold, and apply for FEMA assistance. He is pleased that these videos have been viewed hundreds of times so far.

"We are doing well compared to many people," Elliott said. "Areas that received 4-5 feet of water have been devastated. I wanted these videos to give people some direction during this difficult time."

He plans on staying in Katy — the city is one of the fastest growing communities in the country. He appreciates its large Future Farmers of America program and the community's enthusiasm for football — two things that remind him of Utah State. Elliott admits others may see him as naive, but if this is the new norm, he believes Katy residents will be able to adjust. Harvey didn't stop the high school football team from playing its home season opener in its new \$70 million stadium while cleanup was still underway. And Elliott is looking into increasing the size of his berm.

Shawn Mecham, '86, MS '90, studied communications at Utah State and now works for Texas A&M Extension, training organizations like U.S. Homeland Security, FEMA, and Texas' municipal governments how to respond to emergencies.

"We teach people to make plans for disasters and execute on those plans, but the unexpected always happens," he said.

The unexpected did happen to Houston when its reservoirs began to overfill,

"There are a lot of Aggies in the area that have gone down to help. I've seen the Aggie spirit come through in this time of need. One of the core values of our school is to look after each other, and that has been visible during this crisis."

jeopardizing their integrity, and forcing water managers into the lose-lose decision of letting them overflow and potentially fail or releasing unprecedented amounts of water downstream. Lake Conroe Dam, which has released 15,000-23,000 cubic feet per second in previous storms, let out 79,000 feet per second during Harvey.

"We train people to be flexible and make key decisions," Mecham said. "With all the damage to personal property with Harvey, decisions were made that limited the loss of life. Texas has made strides in this most critical area."

While Mecham lives in College Station, well outside ground zero, he is part of traveling cleanup teams organized by his church. All-day cleanup efforts on Saturdays and Sundays are common.

"There are a lot of Aggies in the area that have gone down to help. I've seen the Aggie spirit come through in this time of need," he said. "One of the core values of our school is to look after each other, and that has been visible during this crisis."

He contrasts this benevolence with a sign he saw on the way to Houston recently: "Will muck out your home. CASH ONLY."

Alumni from Dallas, Austin, and even a student from Logan, are assisting with cleanup after Harvey. Biology major Jennifer Worthy manages Arby's in South Logan but that didn't stop her from adjusting her schedule to aid in relief efforts. She joined the Utah Conservation Corps, an Americorps program part of USU's Center for Civic Engagement and Service Learning. She has participated in two alternative spring breaks, but decided to take the semester off from classwork for a more immersive service experience. From her post in Austin, Worthy is handling logistics for the Americorps in Houston.

"It's crazy to see what goes into this relief effort and the organizations that are here to help," she said. "There are thousands of volunteers, but there also needs to be order so efforts are organized and safe."

Even though Edrea Robertson's home was spared during Harvey, the storm was a painful reminder of an acute pattern emerging in Houston. Robertson, '02, and her family are residents of Montgomery County, one of the lower-eleva-



tion areas susceptible to flooding. Their home is perched on a hill out of harm's way, but that wasn't the case in 2016 when they lived in the floodplain. Last May, historic rains and flooding engulfed the family's dream farmhouse.

While moving their farm animals to higher ground, Robertson discovered her dog face down in the water and unable to be resuscitated. When flooding reached the roof, the family had no choice but to call for a rescue. When they returned, all their possessions were destroyed and their animals gone.

FEMA, flood insurance, and a healthy savings account allowed the Robertsons to relocate and purchase new belongings, but much of what they lost is irreplaceable. They still own the flooded land in Montgomery County, and the building carcasses remain. Robertson visited the area days after Harvey and saw water still cresting the roof of their former home.

Don Wang, '72, has called Houston home for more than 40 years and has never experienced hurricane damage to his home, although Hurricane Ike from 2008 came the closest. His neighborhood benefits from sound engineering, it sits on higher ground, is equipped with underground pumps, and has thoughtful drainage systems.

Wang loves Houston but believes it is overbuilt. Extensive concrete from development the last five years has forced excess groundwater into the reservoirs, he said. Wang suspects flooding from Harvey will prompt the city to address the problem, but engineers will have a formidable opponent — nature.

Flooding was common in Houston before Harvey and back-to-back 500- and 1,000-year storms make it hard to be optimistic about its future. However, of the 20 Aggies I spoke with after Harvey, all are confident that their city will persevere. While they expect the severity and frequency of hurricane-induced flooding to continue, they anticipate new solutions being engineered as well. And when the floodwaters rise, if history and Mecham are right, Aggies will look out for one another.



Photo courtesy of Lionel Adams

## A WAITING GAME

RAFAEL NUNEZ LOGGED ON TO FACEBOOK ONE FRIDAY MORNING IN SEPTEMBER AND FOUND THAT HIS HOMETOWN WAS DESTROYED.

The waterfront hotels of Patillas were gone. Trees were ripped from the ground. Cement houses were all that were left standing after Hurricane Maria, a category four hurricane dropped more than two feet of rain on parts of Puerto Rico. The storm struck just two weeks after Hurricane Irma knocked out power for more than a million residents.

Nunez is one of five Puerto Rican baseball players recruited to play baseball at Utah State University Eastern, Price, including Kenneth Maisonet, Steven Ortiz Torres, Josean Rivera, and Lionel Colon Adams.

"We all communicate with our families every day," he said in October. "Some grocery stores are opening as well as some fast food restaurants. A lot of the islands are without water, and the only electricity is from generators that require gas, so it is expensive to run."

Torres is from the mountainous region of Cayey, and his father works for the power company. He is working nonstop trying to get electricity restored, Torres said. "Everyone is helping in the rebuilding process to get local businesses open."

In the days after Maria, the students anxiously combed social media waiting for loved ones to post updates with news. It would be nearly a week before all of the students learned that their family members were safe.

"We've been hit by hurricanes and tropical storms before, but never one of this magnitude," said Adams, a sophomore majoring in business.

He lives on the island of Vieques, home to about 9,000 people and some of the most pristine beaches in the Caribbean. Typically, when a tropical storm is forecast, most people buy gas and canned food, cover their windows with plywood or metal, and signs are placed throughout the island reading "Prepare Yourself," he said. "We get up to a week's warning to prepare for these events. We've gone through many strong storms every year ... but not one this bad."


Families are celebrated in Puerto Rico, and the family member with the largest house is where people congregate during storms. Everyone brings food and wine and rides out the storm together, he said. Afterward, assessments are made. Homes made from wood are not usually salvageable after a hurricane — between the water and wind, there is usually nothing to save, Adams said.

After Maria, his family texted photos of the devastation. "Most travel companies advertise that our beaches are some of the top 10 in the world," Adams said. "And they are totally gone."

He and Torres arrived on USU Eastern's campus in fall 2016. During the first month of college they found themselves and their baseball teammates shoveling sand into bags for area residents after torrential rain flooded many areas of Carbon County. It's a drill they know well, having helped clean up flood waters in Puerto Rico many times in the past. A full recovery from Maria will likely take years.

—Susan Polster



A group of divers are underwater, holding hands in a large circle. The water is clear and blue. The divers are silhouetted against the light. The title 'PUTTING the Pieces TOGETHER' is overlaid on the image. 'PUTTING' and 'TOGETHER' are in white, and 'the Pieces' is in orange script. The author's name 'By Kristen Munson' is in white to the right of the title.

USU students explore the Great Barrier Reef.  
Photo courtesy of Quinney College of  
Natural Resources.

# PUTTING *the Pieces* TOGETHER

By Kristen Munson

IN APRIL, AERIAL SURVEYS OF THE GREAT BARRIER REEF REVEALED SEVERE BLEACHING ACROSS THE MIDDLE SWATH OF THE PLANET'S LARGEST LIVING STRUCTURE. IT WAS THE FIRST MASS BLEACHING EVENT TO OCCUR IN CONSECUTIVE YEARS ON RECORD. WHEN NEWS HIT THE WIRES, ALARM BELLS WERE STILL REVERBERATING FROM THE YEAR BEFORE.

The Great Barrier Reef is among the most biodiverse ecosystems on Earth; it's home to more than 1,600 species of fish, 450 species of coral, and six of seven species of sea turtles. For Edd Hammill, assistant professor of watershed sciences, rhetoric that describes the reef as 'dead' or 'dying' doesn't help protect the 1,400-mile-long expanse.

"It's totally counterproductive to what needs to be done," he said. "The reef is not perfect. It's taken a knock. But it's a long way from dead."

Bleaching is not a death sentence for coral. But it does indicate the marine invertebrate is stressed. And lately, warming water temperatures and changes in water quality from soil and freshwater runoff have threatened much of the reef's health. Back-to-back bleaching events put additional strains on an already vulnerable organism. That's the bad news. The good news is that it can recover.

"Coral has this ability to regenerate itself. As long as something survives, as long as it has a seeding mechanism," Hammill said. "It has done it before."

Before joining the faculty in the S. J. Jessie E. Quinney College of Natural Resources in 2015, Hammill and Trisha Atwood, also a professor of watershed sciences, lived in Australia studying how changes in aquatic ecosystems affect species interactions and carbon sequestration. They recently brought 12 Utah State University undergraduates to explore a portion of the Great Barrier Reef firsthand as part of a new 11-day field course

where students learn the principles of marine science research and data collection by directly connecting with the environment.

"Living in a landlocked state, people feel so distanced from this atoll," Hammill said. "But these places are relevant to your lives. This is something you can be in. You're part of the ecosystem. You can interact with it."

There were no prerequisites for the class — just a desire to learn, work hard, and the ability to pass a swim test. Students learned to perform fish counts, assess coral health, collect sediment cores, and conduct an original research project on Heron Island, a 72-acre preserve on the southern tip of the Great Barrier Reef. That was exactly what Bryce Bollinger wanted to experience.

"I've been a fisherman all my life," he said. "For me, it's always been about fish. But freshwater was all I knew. It was that not knowing that initially inspired me."



He already had an introduction to research working in Atwood's Aquatic Ecology and Global Change lab where he separates organic matter from rocks and mud. But sorting insects can be tedious work, and the class was a chance to do field work, Bollinger said. "It was the best research ever. It was field work every day. I learned about the professionalism of research and what goes into science, and how much of a group effort it is."

Bollinger and his peers analyzed coral samples to get a snapshot of their health. While most of the area surrounding Heron Island was largely unaffected by the bleaching events of 2016 and 2017, students still identified problems from sedimentation. The students performed fish counts and noted differences in fish population between healthy and sick corals.

"They could see it," Atwood said. "This allowed them to put the pieces together."

Some students had never seen the ocean before enrolling in the course. That's a common experience for many students Atwood and Hammill teach. The ocean is viewed from a distance on episodes of "Planet Earth" or a place one visits to recreate and leave behind. The professors wanted to give students from the Intermountain West a chance to "get up close and personal with the ocean, and to see the problems with it. Many of them are human caused," Atwood said.

One arm of her research examines the role of vegetated coastal ecosystems, such as salt marshes or mangroves, for carbon storage. These zones play an out-sized role in climate regulation. Estimates suggest that despite covering less than one percent of the planet, these ecosystems are responsible for nearly half of the carbon captured in the ocean.

"When researchers started looking at sediment [in these areas] they found that it was the most carbon rich in the world," Atwood said, adding that they can capture carbon 40 times faster than terrestrial soils. "It's one of the cheapest ways of carbon mitigation in the world. It's a natural system that's already there. We just have to maintain them."

But that's where it gets tricky. Vegetated coastal ecosystems serve as nurs-

eries for fish populations, help prevent soil erosion, and sequester carbon in the soil. And although most are protected regions, it doesn't mean they aren't harmed by human development, pollution, or changes in the food web. For instance, Atwood and Hammill investigate how changes in predator populations may affect bioerosion and carbon cycling in aquatic ecosystems. The pair recently tested what happens when ocean acidification occurs and box jellyfish are added to the mix. It turns out, less zooplankton — 25 percent less than expected.

"Zooplankton are the crucial link between algae in the ocean all other animals," Hammill said.

Their findings were published in the journal *Global Change Biology* in August. Beyond teaching students the tenets of marine research, it was important for Atwood to provide Utah State students with an immersive experience. Growing up in Evanston, Wyoming, her parents did everything they could to nurture her love for marine science. As a middle school student, they sent Atwood to Florida for snorkeling camp. She recalls slipping into the water thinking, *I can't believe my teachers are letting me do this*. That same excitement is palpable in blog entries USU students posted about their trip.

"Edd and Trisha have opened a wonderful opportunity for a bunch of desert rats from Utah to experience the wonder of marine life," Audree Van Valkenburg, wrote. "Each time a new bird or the shadow of an aquatic appears under the surface of the water, all come running to see as well. We are all scientists in training."

Some students learned they actually don't want to pursue a career in marine biology, but returned feeling connected to the ocean,

Atwood said. "I think that it's taught a lot of them that science is not easy. It's complicated. And requires dedication to carry out a single sampling event in the ocean."

The students and faculty members are also connected to each other in a way that gets accelerated when you spend 24 hours a day together, every day, on a small island in the Pacific Ocean. Traditional dynamics change. Any awkwardness disappears fast, Van Valkenburg said. "Now, it's like meeting with a mentor, not just a professor. I know Ed and Trish care about us."

Van Valkenburg was awarded an Undergraduate Research and Creative Opportunities grant from the university to conduct an independent research project during the class. She enrolled hoping the experience would help her overcome a nagging fear: what happens if you fail? It was something she was forced to confront.

"We experienced setbacks with my project," Van Valkenburg said. "I think that the reason people don't try for things that are hard is because they don't want to fail. I think that holds a lot of people back, but I think the failures are where you learn."

She is now certain that she wants her future to involve research. And one day she aims to return to the Great Barrier Reef to study it.

"I knew it was struggling and that bleaching was happening," Van Valkenburg said. "It's a sick reef. But afterwards I gained a lot of hope."

The Great Barrier Reef is home to six of seven species of sea turtles like the one pictured here. Photo courtesy of Quinney College of Natural Resources.





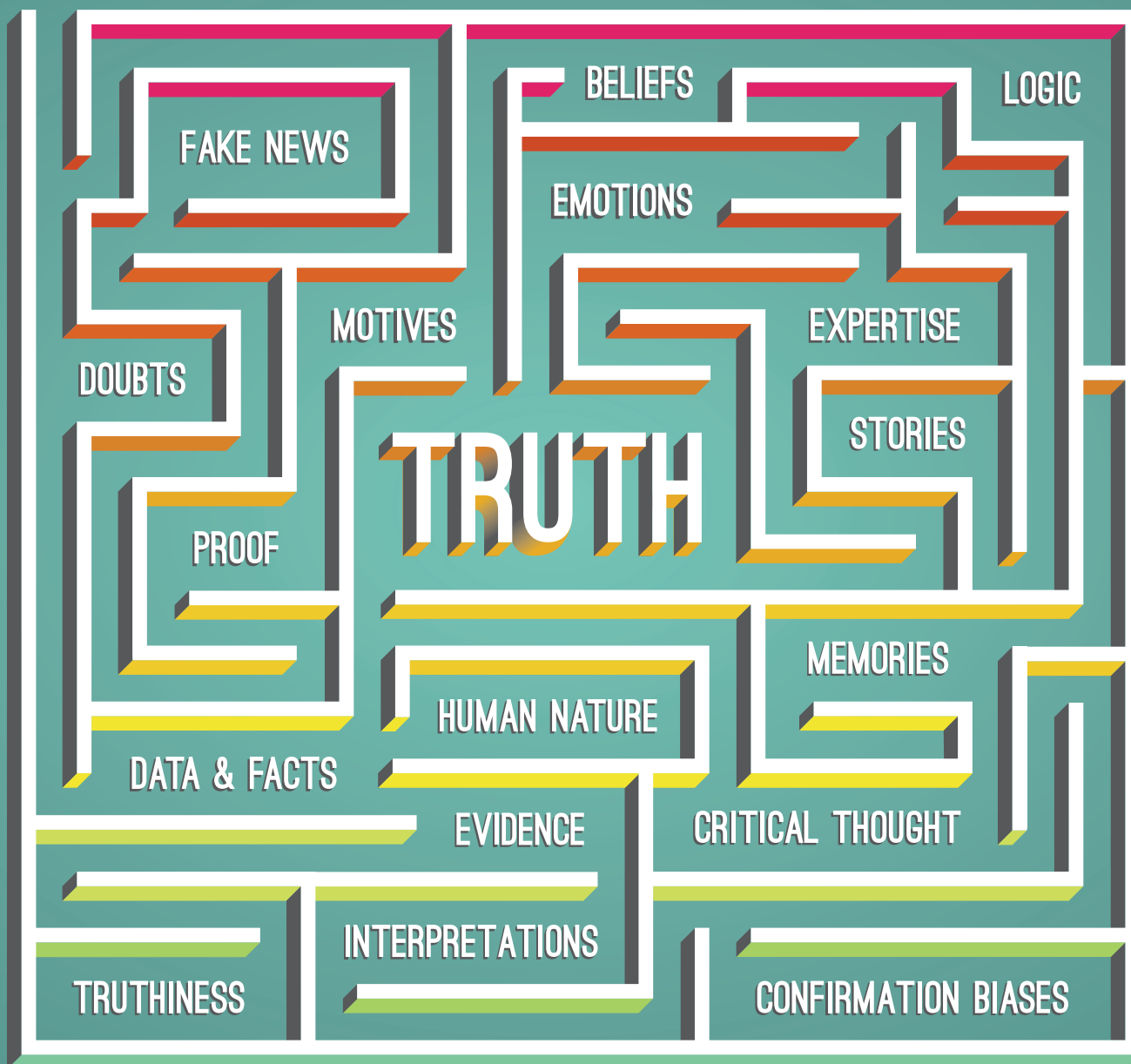


Illustration by Liz Lord.

# TRICKY TRUTH

By Janelle Hyatt

HERE'S A FACT: TRUTH IS COMPLICATED.

Here's a truth: Asking a philosopher for any insights isn't much help.

"Actually," said Charlie Huenemann, a philosophy professor, "it's a very simple idea."

If what you say matches what is, he says, then it's truth. Truth, despite its seeming simplicity, becomes muddled when you mix it with human nature. This inevitability is at the center of a new series of faculty panel discussions, "Facticity: Critical Thought in a Time of Doubt."

The Facticity series, which is free and open to the public, marks the first time USU department heads have come together to sponsor such a continuing effort, said Laura

Gelfand, one of the organizers and head of the interior design program in the Caine College of the Arts. The topic of truth was selected, she added, because "in the age of fake news, the truth is something we are all thinking about more than ever."

The series launched its season September 12 with a discussion tackling the seemingly basic question of why,



exactly, truth is complicated. The second panel “Truth and Consequences” was held November 14; two additional panel discussions are scheduled for spring semester.

“We need to know the nature of the problem, why truth is such a slippery and difficult goal to attain, so we put ourselves in a better position to navigate this complicated landscape,” said Timothy Slocum, an organizer of the series and department head of Special Education and Rehabilitation. Back to the philosopher.

Picture a graph, said Huenemann, indicating data points that each represent a fact. You can connect those data points in a straight line. Or a curvy line, or maybe even a jagged line. “There are many ways — in fact, infinite ways — of connecting those points,” he said.

During the “Truth is Complicated” panel, the experts — a philosopher, a sociologist, a business consultant, and a specialist in Shakespeare — came to a similar conclusion. The fault, paraphrasing Shakespeare, is not in our facts, but in ourselves. When we seek to find truth, we’re searching through a thicket of personal motivation, bias, context, and memories.

“Facts rarely exist in a vacuum,” noted English professor Phebe Jensen.

For instance, even when we enter the scientific world of medicine to visit with a physician, what’s “true” isn’t black or blue.

“For it to be true,” she said, the diagnosis “has to take into consideration the story of you and your family, your emotional and spiritual resources, and what you believe.”

That’s why most medical schools now offer programs in another category of truth, the medical humanities, she said. “Medical practitioners who treat human beings, not robots, need to be able to be able to think about facts from multiple perspectives.”

Courtney Flint, a sociologist who looks at the intersection of humanity and nature, hears different truths from many stakeholders. A subject like environmental health offers “a complicated bundle of truth,” she said. No perspective, whether from Alaskan villagers or lab-jacketed scientists, is less or more “true” than the other viewpoints — but one can “crowd out” other perspectives.

But “truth is tricky because it requires asking questions, and that requires moving us away from certainty,” Flint said.

Aaron Brough studies biases in his role as an associate professor in business management. One of the most common biases we have seeks to confirm what we already believe, he said. Often, when we settle on a theory, he explained, “we begin to see all kinds of facts that support that theory, and we tend to ignore facts that will dis-confirm our theory.” And this, he said pointedly, “isn’t just true about people who disagree with you.”

As the Facticity panels continue to explore the question of truth, organizers will draw on professors from all corners of Utah State University. Future topics include “Truth and Proof” and “Truth and Truthiness.”

## 1930s

Reed A. Schwendiman ‘39, Jul. 16, WA

## 1940s

Melva Siegfried Baron ‘48 Att, Jul. 28, UT  
Wesley E. Bartholomew ‘49, Jul. 26, UT  
Doris A. Bishop (Johnson) ‘48, Jul. 4, UT  
Lucile Crockett (Macfarlane) ‘43 Att,  
Aug. 31, UT

Melda Vickers Fackrell ‘40, Sept. 4, UT  
Ray G. Forman ‘49, Sept. 2, UT  
John P. Fugal ‘43 Att, Sept. 24, UT  
Charles H. Hardy ‘48, Jul. 2, UT  
Darwin C. Hendricks ‘49, Sept. 29, UT  
Darrell H. Jensen ‘49, Oct. 2, UT  
Aldus B. Johnson ‘48, Aug. 7, UT  
Ann Wheelwright Johnson ‘48,  
Sept. 9, UT

H. Alan Luke ‘41, Sept. 20, UT  
Melvin L. Manning ‘42, Jul. 30, UT  
Harold William Phillips ‘42, ‘55MS,  
Aug. 17, ID  
Lucille E. Pugh (Stephens) ‘48, Jul. 3, OR  
Dorothy L. Roundy (Ellsworth) ‘45,  
Oct. 8, UT

Wallace D. Sabin, Jr. ‘49, Aug. 1, AZ  
Brig Gen Norman J. Salisbury ‘45 Att,  
Aug. 11, UT

Paul H. Sharp ‘49, Jul. 14, UT  
Thomas Taylor ‘47, ‘66MED, Aug. 5, ID  
Hazel Tomlinson (Aland) ‘48, Aug. 25,  
WA

Mary I. Twitchell (Dalley) ‘49, Jul. 26, UT  
Jayne R. Walters ‘48, Aug. 14, MI

## 1950s

Mahmoud K. Agah ‘56MS, Oct. 16, CA  
Barbara Kekauoha Aldous ‘51, Sept. 29, UT  
Orson D. Alston ‘51, ‘62MS, Sept. 15  
Wayne Bankhead ‘54, Oct. 2, UT  
Corrine Berg (Cowley) ‘51 Att, Jul. 12, UT  
Rial Alden Black ‘50, ‘61MED, Jul. 26, UT  
Raymond G. Briscoe ‘55, Sept. 16, UT  
Barbara Brown (Tidwell) ‘52 Att, Oct. 5,  
UT

Fon R. Brown ‘55, ‘62MS, Aug. 8, AZ  
Marva Fitzgerald Brown ‘54, Aug. 6, UT  
Robert Buffington ‘56, Mar. 13, AZ  
John L. Burgoyne ‘51, Sept. 12, UT  
Dean N. Charburn ‘51MS, ‘73EDD,  
Sept. 9, ID

Norman John Child ‘51, ‘64MED,  
Aug. 15, UT  
Ray Earl Child ‘54, Sept. 4, UT  
Grant S. Christensen ‘50, Aug. 29, ID  
Darwin W. Christensen ‘58, Aug. 13, UT  
J. R. Cooper ‘53 Att, Sept. 21, UT  
Noel R. Critchfield ‘59, Aug. 26, UT  
Virginia Miller Crook ‘50, Jun. 24, CA  
Lowell Dahl ‘50, Jul. 26, UT  
Gerald Willard Day ‘50 Att, Sept. 8, UT  
Wade G. Dewey ‘53, Jul. 31, UT  
Marie McCarrey Dotson ‘59, Jul. 30, UT  
Shauna Smith Eccles ‘55 Att, Sept. 23, UT  
Marcus B. Garrett ‘50, Sept. 14, UT  
Ronald E. Gunther ‘58, Jul. 2, ID  
Lloyd F. Hall ‘57, Sept. 16, UT  
Miles O. Hall ‘56, ‘60MS, Sept. 20, CA  
Darwin R. Halling ‘58, Aug. 9, UT  
Walter G. Hames ‘54, Jun. 5, CA  
Elgin D. Handy ‘57, Sept. 5, UT  
Fred O. Haroldsen ‘50CE, ‘61ME,  
Jul. 14, ID

Alton L. Hatch ‘54, Sept. 9, ID  
Shirley Hilton (Bowman) ‘52, Jul. 26, CA  
Weston J. Hirschi ‘56, Jul. 28, UT  
Bert D. Hunsaker ‘56, Aug. 15, UT  
Floyd E. Kinsinger ‘57PHD, Aug. 17, UT  
Anna L. LaPray (Rallison) ‘58, Sept. 20, UT  
Lt Col Dwendon M. Lee ‘54, Sept. 21, UT  
Don H. Markham ‘50, Jul. 20, UT  
Glenn J. Mecham ‘57, Jul. 23, UT  
Dennis S. Miller ‘54 Att, Sept. 30, UT  
Gene W. Miller ‘50, ‘54MS, Jul. 19, UT  
Vern L. Moore ‘57, Oct. 10, ID  
Robert Eldredge Moss ‘54, Sept. 30, UT  
Reed W. Mower ‘51, Aug. 4, UT  
Venice P. Munro ‘53, Aug. 11, ID

Dennis E. Nelson ‘50, ‘56MS, Jul. 30, UT  
Claire A. Nielsen ‘51, Sept. 12, UT  
John L. Ospital ‘59, Sept. 13, UT  
Louis E. Overson ‘59, ‘63MIE, Sept. 24, UT  
Doyle D. Perkins ‘53, Aug. 31, UT  
Vernice Hillyard Peters ‘56, Sept. 1, CA  
Hyrum H. Peterson ‘55 Att, Jul. 30  
Karl E. Pettigrew ‘59, Aug. 4, UT  
Annice Potter (Benson) ‘55, Aug. 8, UT  
Harlan G. Pulsipher ‘50, ‘56MS,  
Sept. 24, UT

Janice Reid ‘51, Aug. 8  
Ross Rudd ‘54, Aug. 29, UT  
Janice J. Sackett (Johnson) ‘58 Att,  
Jul. 19, UT

John H. Scheffel ‘59, Aug. 23, UT  
Ronald J. Searle ‘50, Aug. 29, ID  
Donald L. Simis ‘53, Sept. 28, ID  
Dorene Hendricks Skidmore ‘56 Att,  
Sept. 22, UT

Jay E. Stewart ‘58, Aug. 13, UT  
Helen E. Stokes (Stott) ‘50, Oct. 3, UT  
Richard W. Taylor ‘57, Jul. 15, UT  
Richard Y. Thurman ‘52, Aug. 26, UT  
Edward H. Turek ‘53, Sept. 4, NV  
Bruce K. Veibell ‘56, Aug. 21, UT  
Jesse Wagstaff ‘59, ‘70PHD, Sept. 1, UT  
Antoinette Ball Weight (Wyatt) ‘58,  
Sept. 28, UT

Erol C. Wiscombe ‘57 Att, Sept. 27, UT  
Rhea Wray (Moss) ‘55, Aug. 6, AZ

## 1960s

Justin J. Anderson ‘66 Att, Jul. 17, UT  
Harold D. Ashcraft ‘60, Sept. 3, UT  
Donald Eugene Boerup ‘60, Jul. 10, AZ  
Bruce Newell Bradley ‘69, Aug. 21, ID  
Lionel William Brown ‘60, Aug. 4, UT  
James B. Burrows ‘61 Att, Jul. 24  
M. Kent Cannon ‘60, Aug. 1, NV  
Richard E. Carlson ‘62, Aug. 23, UT  
Marie Adele Christensen (Hansen) ‘64  
Att, Aug. 20, UT

John O. Cliff ‘64, ‘67MS, Oct. 12, TN  
John Ross Clyde ‘60, Aug. 8, UT  
Vincent L. Cropper ‘66, Sept. 14, UT  
Carol Sharp Ediger ‘67, ‘03MED,  
Jul. 24, UT

Michael D. Erickson ‘60, Sept. 16, UT  
William Grant Evans ‘67, Aug. 18, UT  
Jerald A. Finlinson ‘62, Aug. 20, ID  
Marguerite L. Fryer ‘68MS, Sept. 10, CA  
Dennis W. Gilpatrick ‘60 Att, Jul. 10, CO  
Lawrence D. Goodsell ‘66, Oct. 1, UT  
J. D. Hales ‘62 Att, Aug. 30, UT  
Ann L. Heck ‘66, Jul. 27, ID  
Clayton S. Huber ‘62, ‘64MS, Sept. 5,  
UT

Douglas Ray Jensen ‘64, ‘65MS, ‘69PHD,  
Jul. 12, UT  
Jalaine Pitcher Jensen ‘67, ‘70MS,  
Oct. 6, UT

Nick P. Kapos ‘61, Sept. 20, UT  
Clinton O. Kingsford ‘65, Aug. 1, ID  
Calvin R. Lamborn ‘64MS, ‘69PHD,  
Aug. 19, ID

Aileen Larsen ‘64, Oct. 1, NV  
Sherwin Larsen ‘60, Oct. 7, UT  
Wayne D. Lebaron ‘60, Aug. 21, UT  
Judy Lewis (Beck) ‘69, Jul. 29, UT  
Peter P. Michaelatos ‘62, Feb. 11, CA  
Melba Moore (Whittier) ‘69, Aug. 17, ID  
Lewis M. Mulkay ‘65, Aug. 5, ID  
Weber Neal Paulson ‘60, Jul. 26, UT  
Gwendlyn Fredricksen Peterson ‘62,  
Aug. 13, UT

Barbara Randall (Birkhead) ‘61,  
Sept. 19, UT  
E. Allen Roylance ‘64, Jul. 15, UT  
John T. Skinner ‘67, Aug. 18, CA  
Ruth P. Smith ‘67, ‘70MED, Sept. 15, UT  
Florence Deann Twitchell (Tidwell) ‘65,  
Aug. 10, UT  
Diane Smart Waters ‘65, Oct. 9, UT  
Thomas H. Williams ‘63, Aug. 28, CA  
Thomas L. Williams ‘64, ‘66MS,  
‘73PHD, Sept. 9, UT



# AIN MEMORIAM

Through October 31, 2017

## 1970s

Gordon Leroy Anderson '71, Sept. 24, UT  
Robert C. Andrews '71, '73MED, Jul. 3, NY  
Michelle Bearson (Pace) '74, Sept. 29, UT  
John Costello '76, Jul. 23, VA  
Carl D. Crowther '70, Aug. 17, UT  
Mike Erich '76, Jul. 19, UT  
Zane A. Erickson '75, Sept. 14, NC  
Marilyn Fryer (Bushnell) '79, Aug. 8, UT  
Dennis R. Godderidge '78, Aug. 12, UT  
Donna F. Gorman (Schiffman) '71, Sept. 5, UT  
Ronald J. Hirko '70PHD, Aug. 6, SD  
Mollyanne M. Hopkins '79 Att, Aug. 17, UT  
Karen Janes '73MS, Jul. 17, AZ  
Kathryn Jensen (Brown) '72 Att, Aug. 16, UT  
Steven L. Kimball '70MS, '75PHD, Oct. 3, UT  
Randall Gurell Maughan '75, Sept. 17, ID  
Mark R. May '75 Att, Jul. 16, UT  
Douglas C. McDowell '74 Att, Sept. 3, UT  
Michael J. McLatchy '75PHD, Jul. 10, UT  
Judy F. Morris '79 Att, Jul. 13, UT  
Rose M. Mullan (Gershowitz) '74, Aug. 2, WA  
Helena Murri Page '74, Aug. 19, ID  
Maran Carl Pate '76, '79MS, Aug. 17, AZ  
Greg Peterson '74 Att, Aug. 13, ID  
Stanley J. Racker '72 Att, Jul. 12, UT  
Steven R. Smith '79, Jul. 22, UT  
Larry B. Tanaka '76, Jul. 22, UT  
Lucy Ann Thompson '77, Aug. 9, UT  
Barbara A. White '70MS, Sept. 12, UT  
Bill Norman Wright '73, Sept. 15, UT

## 1980s

Linda Bartel '82, Aug. 13, UT  
John R. Baugh '85MBA, Sept. 9, UT  
Bill E. Cowan '83MS, Sept. 23, UT  
Kimball R. Findlay '80, '85MED, '87EDS, Aug. 30, AL  
Sherrie L. Green (Vail) '84, Jul. 19, UT  
David Pecora '88, Oct. 4, CA  
Katherine M. Potter '80, Aug. 28, UT  
Calvin A. Richards '80, Sept. 14, UT  
Jeffrey Parr Salt '81 Att, Jul. 22, UT  
Lindsey Selam '80, Aug. 1, WA  
Janet Smith '84, Aug. 21, ID  
Janet M. Taylor '88MED, Jul. 29, UT  
Michelle Thompson '83, Jul. 13, UT  
Linda S. Warren (Jensen) '80 Att, Aug. 6, UT

## 1990s

Tanya L. Bartlett '98, Sept. 13, UT  
Roger G. Bunker '97MAC, Oct. 2, UT  
Julia A. Clark '90MED, Aug. 17, CA  
Shannon D. Hales '96, Aug. 22, UT  
Gordon E. Hoffman '92MBA, Aug. 2, UT  
Randy Miles Jensen '95, Jul. 18, UT  
Allen J. Kissner '90, Jul. 24, CO  
Carole J. Matheson '90 Att, Jul. 8, UT  
Isabel E. McFarland '97PHD, Sept. 16, UT  
Olivia M. Phelps '93MSS, Aug. 23, UT  
John L. Sullivan '98MS, Aug. 27, UT  
Amy E. Summers '98 Att, Jul. 24, MD  
Danielle D. Thom '94 Att, Sept. 11, UT  
Teresa Yonk Williams (Liechty) '90 Att, Sept. 26, UT  
Wade Walker Workman '92MBA, Aug. 27, UT

## 2000s

Brian A. Bitner '04, '07MBA, Sept. 18, UT  
Jessie J. Eborn '06, Jul. 21, ID  
Joan L. Herd '02, Sept. 26, UT  
Stephanie McCawley '06MRC, Aug. 18, WY  
Kathleen M. Mills '08 Att, Sept. 1, UT

## 2010s

Laura Catheryn Early '10 Att, Sept. 29, CA  
Ty Thomas Hall '17 Att, Sept. 4, UT  
Ashley Coral Halverson '16, Sept. 30, UT  
Kimberly R. Hayes '12, Jul. 23, UT  
Devin Richard Huff '16 Att, Jul. 26, UT  
Wyatt F. Kennedy '10, '13, Sept. 23, UT  
Tara Ciere Moser '11 Att, Sept. 15, UT  
Eliza Marie Clawson Olson '11, Aug. 17, FL  
Joey B. Penovich '17 Att, Aug. 19, UT  
Matt F. Prante '13MS, Sept. 13, NC  
Diane Riggs '11 Att, Jul. 21, UT  
Nicholas Thomas '10, Jul. 13, UT  
Chelsey Meg Wood '19 Att, Aug. 24, ID

## FRIENDS

Richard L. Abraham Jul. 26, UT  
Bryant A. Alder Mar. 16, OR  
Jason Anderson Jul. 18, ID  
Larae Anderson Sept. 3, UT  
Larry Andrews Aug. 5, UT  
Jon R. Arnold Aug. 30, UT  
Cheryl Baker Jun. 5, UT  
George Barrus Jul. 27, IN  
Gilbert K. Blau Sept. 24, UT  
Floyd Campbell Jul. 14, UT  
Jill J. Cannon Jul. 14, UT  
Erin Carlson Jul. 24, UT  
Dorothy Carver Sept. 19, CA  
Joyce Williams Chiaretta Sept. 11, UT  
Mary Ellen Cloninger Jul. 9, UT  
Clyde A. Coates Sept. 7, UT  
Alan M. Collier Jul. 19, UT  
Karen Craig Jul. 25, UT  
Janel Anhdher Curtis Aug. 2, UT  
Vernon Cutler Sept. 9, UT  
Daniel R. Dalfonso Aug. 22, UT  
Dan DeTemple Aug. 26, UT  
Keith Dibble Aug. 7, UT  
Paul H. Didericksen Jul. 18, UT  
Ian Dowie Jul. 12, UT  
Stella Drake Aug. 22, CA  
Beverly M. Ferick (Marshall) Sept. 6, UT  
Gary Forsyth Sept. 7, UT  
Juan N. Franco Aug. 1, NM  
David Cecil Fuller Sept. 14, UT  
Beryl Furner Jul. 20, UT  
Ronald Garcia Aug. 14, UT  
Bill Geisdorf Jul. 30, NV  
Arvella B. George Sept. 28, UT  
Ronette Gibson Aug. 8, UT  
Bruce R. Giddings Sept. 13, UT  
Fred E. Gonzales Sept. 19, UT  
Gary H. Green Oct. 1, UT  
Elder Robert D. Hales Oct. 1, UT  
Milton Hall Sept. 9, UT  
Edwin Hansen Aug. 28, UT  
Greg W. Haws Sept. 14, UT  
Diane Heare Jul. 16, UT  
Herbert F. Hoover Jan. 5, CA  
John Howell Sept. 23, UT  
Allen L. Ipsen Aug. 21, UT  
Neal Jenkins Aug. 21, UT  
Jolene T. Johnson Sept. 24, ID  
Roy Johnson Sept. 23, ID  
Dorothy H. Kidman Aug. 23, UT  
Richard Kieffer Aug. 30, UT  
Bob Kieser Sept. 1, AZ  
Marilyn Mortensen Konopasek Jul. 28, UT  
Jean Larsen (Allen) Aug. 19, UT  
Howard LeVaux Aug. 28, MA  
Sheila Lewis Sept. 28, UT  
Gordon R. Loveless Jul. 26, UT  
Donald A. Mackey Jul. 18, UT  
Terry Markham Sept. 12, UT  
Verl Baxter Matthews Aug. 17, UT  
Nancy May Jul. 16, UT  
Gladys McCraney Oct. 6, UT  
Macoy A. McMurray Jul. 27, UT  
Steven McNeil Sept. 17, UT  
Emma P. Merkely (Parcich) Jul. 30, CA  
Michael D. Morgan Aug. 25, UT

Lyle V. Nelson Sept. 17, UT  
Doug Newman Oct. 12, UT  
Wesley Nielsen Oct. 8, UT  
Katherine B. Ostermiller Sept. 15, UT  
Lexey Otterstrom Aug. 21, UT  
Byron Palmer Sept. 17, AB  
Monroe J. Paxman Sept. 25, UT  
Ann W. Pearson Jul. 24, WA  
Eugene L. Peay Aug. 19, UT  
Betty Jean S. Petersen Sept. 15, UT  
Clyde W. Petersen Sept. 14, UT  
Bruce Porter Dec. 28, UT  
Sandra J. Preece Aug. 31, UT  
Vasilios Priskos Oct. 9, UT  
Gary L. Robinson Oct. 6, UT  
Gloria Romney (Norris) Sept. 1, UT  
Grant W. Roylance Aug. 12, UT  
Walter L. Saunders Aug. 2, UT  
Deann Savage Aug. 4, UT  
Victoria A. Schkudor Jul. 15, UT  
Cory Sheen Jul. 14, UT  
Paul E. Sherrick Aug. 2, UT  
Margaret Sjoblom Oct. 5, UT  
Quentin R. Smelzer Aug. 7, UT  
Darell A. Smith Aug. 9, UT  
Paul E. Smith Jul. 4, NC  
Shirley Smith Oct. 5, UT  
Bruce Farrell Sorensen Sept. 9, UT  
LoReta Sorensen Aug. 23, UT  
Lindy Spendlove Oct. 2, UT  
J. Michael St. Clair Sept. 12, UT  
Sydna Swenson Aug. 12, UT  
Ken C. Taylor Jul. 14, UT  
Kip R. Tuttle Aug. 5, UT  
Donald Voit Aug. 8, UT  
Milton Wall Jul. 26, UT  
Allen T. Wardle Aug. 31, UT  
Ardean W. Watts Jul. 21, UT  
Kenneth R. Wilson Sept. 12, UT  
Lerue Winget Oct. 10, UT  
Harry S. Wolford Sept. 15, UT  
Reid R. Wuthrich Sept. 10, UT  
Frank K. Yoshimura Aug. 27, UT  
DeVon Zumbrennen Jul. 26, UT

## ATTENDERS

Michelle C. Adair Att, Jul. 22, OH  
Arita Rae Adams Att, Oct. 7  
Constantino Anast Att, Aug. 6, CA  
Melissa Louise Anast Jul. 27, UT  
Earl V. Anderson Att, Sept. 9, UT  
Reta Thomson Armstrong Att, Aug. 12, ID  
David Jess Barr Att, Sept. 17, UT  
Patricia Murdock Barron Att, Jul. 3, CA  
Doris Darling Stevenson Barton Att, Jul. 13, UT  
Robert Asa Boozer Att, Sept. 17, ID  
Jacketta World Brewer Att, Sept. 16, UT  
Norma Gale Burrows, Schow Att, Sept. 2, UT  
Michael Kim Carpenter '80, Sept. 22, WA  
Nancy Jane Christman (McKibben) Att, Jul. 22, OR  
Mitchell Aaron Covert Att, Jul. 28, UT  
Joyce Cox Att, Jul. 25, UT  
John Wayne Creer Att, Aug. 8, UT  
Lynn Mahagin Dahl Att, Aug. 10, MT  
Shawn Allen Dansereau Att, Aug. 19, UT  
Pauline Obray Davidson Att, Jul. 26, ID  
Richard E. Davies, Jr. Aug. 30, UT  
Jesse Lee Davis Att, Oct. 1, UT  
Jon Davis Att, Aug. 11, UT  
Robert D. Edlund Att, Jul. 13, UT  
Ruth Robinson Elggren Att, Sept. 25  
Virgil J. Engvall Att, Jul. 27, UT  
Remo Etzel Att, Sept. 16, UT  
William Joseph Finnerty II Att, Aug. 17, UT  
Boyd Fieldsted Att, May 31, UT  
Susan West Flygare Att, Jul. 23, UT  
Norma Funk Att, Jul. 20, UT  
Brent Atkinson Gamble Att, Oct. 3

Clayton Eugene Garren Att, Aug. 28, AR  
Mariam Grimes Att, Mar. 10, PA  
Kathryn D. Halamandaris (Dragatis) Att, Jul. 23, CA  
Rene Ione Hamblin (Raymond) Att, Oct. 6  
Donald B. Hanna Att, Aug. 10, UT  
Myrna Hanna Att, Aug. 22, UT  
Arvin Hansen Att, Aug. 23, ID  
Victor E. Hansen Att, Sept. 1, UT  
Virgene Creamer Hansen Att, Aug. 25, UT  
Larry J. Harrington Att, Sept. 8, UT  
Blaine Hatch Att, Sept. 20, UT  
Dennis George Hill Att, Aug. 28, ID  
Suzann V. Hill Att, Sept. 15, UT  
Edwin Neeley Hinckley Att, Aug. 10, SC  
Betty Holbrook Att, Aug. 8, UT  
Leonard Knudsen Hoskins Att, Jul. 13, UT  
Jerry Howell Aug. 13, UT  
Cleo Tibbitts Hugie Att, Sept. 30  
Kristy Lee Hunt Jul. 25, UT  
Joseph Earl Jackson Att, Oct. 2  
Patsy K James Att, Sept. 21, UT  
Lois S. Jensen (Snow) Att, Jul. 28, UT  
Muriel Smiley Kent Att, Aug. 7, NV  
Charline Sage Ketcherside Att, Jul. 20, CA  
Stephen Stanley Konz Att, Aug. 16, WA  
Alice May Larsen Att, Sept. 15, UT  
Glen Elmo Larson Att, Aug. 7, UT  
Sara Lauffer Att, Aug. 17, UT  
Valene Y. Life (Young) Att, Sept. 5, CA  
Ann Carver May Att, Sept. 20, UT  
Carol LeFevre Milligan Att, Sept. 25, NY  
David Peter Monson Att, Jul. 31, UT  
Judy Jorgensen Morris Att, Jul. 13, UT  
Robert Dennis Murray Att, Aug. 30, UT  
Blen D. Nance Att, Sept. 8, UT  
Joan Rigby Nissen Att, Aug. 24, UT  
Mitchell Stuart Olsen Att, Sept. 6, UT  
Coie J. O'Malley Att, Aug. 13, AZ  
Jean Parker Att, Jul. 31, UT  
Gary C. Peterson Att, Jul. 27, UT  
Quint Pickup Att, Sept. 20, UT  
Ray A. Prettyman Att, Aug. 12, UT  
James L. Procarione Att, Jul. 18, UT  
Rosalind Ralphs Att, Sept. 24, UT  
Lt Col Gene Russell Rasmussen Att, Oct. 12  
Janette Bailey Rasmussen, Wyatt Att, Aug. 30, UT  
JoAnne Duncan Reed Att, Sept. 14, UT  
Mykel A. Riddle Att, Jul. 31, UT  
Mollie Rogers Att, Jul. 6  
Erling Roylance Att, Jul. 15, UT  
Jason P. Sanchez Att, Aug. 15, UT  
Melville Scholz Att, Sept. 13, WA  
Ronald Shupe Att, Aug. 10, ND  
Mary Jean Simis Att, Sept. 13, ID  
Kent John Singleton Sept. 9  
Paul Lesly Smart Att, Aug. 18, UT  
Arthur P. Smith Att, Aug. 27, UT  
Bresha J. Smith Att, Oct. 10, UT  
John Ramsey Snook Att, Jul. 20, HI  
Gerri Spesert Att, Aug. 30, UT  
Gwen P. Steadman Att, Sept. 6, UT  
Jason Dean Stevens Att, Aug. 3, UT  
Carol Ann Stinner (McKewen) Att, Sept. 4, UT  
Zina LaReata Tabor Att, Jul. 15, UT  
Jed Dee Thomas Att, Aug. 13, WA  
Vauna Julene Thorderson Att, Aug. 29, UT  
Connie Thorngren Att, Oct. 1  
Brenda Kathy Turner Att, Jul. 31, UT  
Arthur Valdez Att, Aug. 5, UT  
Fred Kay Vosburg Att, Aug. 20, NV  
Edward A. Wallace Att, Jul. 6, UT  
Tyla Johnson Walton Att, Aug. 23, UT  
Evangeline G. Welke Att, Mar. 27, CO  
Donald M. White Att, Jul. 21, FL  
Eric Bradshaw White Att, Aug. 31, CA  
Douglas L. Whitney Att, Aug. 21, UT  
Don Gardner Widdison Att, Jul. 15, UT  
Rodney Charles Workman Att, Jul. 5, UT

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