

Volume 6, Issue 1

[www.sonoma.edu/scitech](http://www.sonoma.edu/scitech)

October 20, 2016

### Greetings from the Dean

This summer, the campus welcomed new president Dr. Judy Sakaki, who is driving a strong university-wide agenda focused on student success and raising SSU to an even higher level of excellence. Academic leadership is also changing with Interim Provost, Dr. Jeri Echeverria, replacing Andrew Rogerson who left to lead the University of Arkansas at Little Rock. Other changes in University Development, Student Affairs and in other units are indicators of exciting times and opportunities ahead for Sonoma State University and our School of Science and Technology.

As part of the CSU Graduation Initiative, we are focused on improving 4-year and 6-year graduation rates, with the goal of identifying and eliminating roadblocks to our students' success.

We're also working to enrich diversity in our STEM programs and determining how we can increase interest, participation, retention and graduation for all our students. With a campus ratio of 63% female to 37% male, our engineering and computer science programs have only 14-15% women students. Our new Director of Women in Tech, Dr. Sara Kassis, is identifying strategies to improve these numbers by bringing more women into these fields and providing an environment to help ensure their success.

In support of our commitment to student engagement with faculty, we added eight new permanent faculty members this Fall (see the new faculty profiles in this issue) and are conducting searches to bring six more in Fall 2017. We are thrilled to welcome our faculty and staff and our new and returning students to the new academic year and wish them much success as they work to achieve their goals.

Our faculty continue to strive for excellence in their teaching. We are proud of their efforts as they make a difference every day for our students. Dr. Lauren Morimoto (Kinesiology) was awarded the University's 2016-17 Excellence in Teaching Award, and Dr. Jeremy Qualls (Physics & Astronomy) received the 2016 Excellence in Education Award from the

Santa Rosa Chamber of Commerce this summer—bravo for their commitment to student success! Our faculty also continue to achieve excellence in their areas of research and, in collaboration with students and others, have been awarded over \$3 million in federally sponsored research grants in recent months. The 4<sup>th</sup> Annual Science Symposium in May 2016 showcased the work of our largest group of undergraduate and graduate research students to date. Over 125 students presented their research in this capstone experience. Industry partners, community members, faculty mentors, our dedicated and incredibly resourceful staff and our SSU students made this an especially impressive demonstration of the learning going on in our School.

Our School's achievements also rely on a strong and growing network of alumni, volunteers, faculty emeriti and donors who enrich and elevate our student's experience. Be sure to read in this issue about our alumnus Dale Abrams and our volunteer faculty emeritus Don Marshall – two treasured members of the Science & Technology community.

It's an exciting time to be a part of Sonoma State. I am proud of our accomplishments and look forward to this year of educating the next generation of scientists, engineers, mathematicians, and health professionals while also sharpening the vision of our campus with new leadership, driven by our values and carried by our excellent faculty, staff, donors and community partners. I'm sure you will enjoy reading this issue and learning more about what we're up to. We invite you to join us for our colloquia (see [www.sonoma.edu/scitech/pls](http://www.sonoma.edu/scitech/pls)), partner with us in the classroom and support us as we educate future thinkers, problem solvers, givers and leaders.

Warmly,



Lynn Stauffer, Dean



## Dr. Daniel Crocker Named a Fellow at California Academy of Sciences



Dr. Daniel Crocker, Professor of Biology, has been named a [Fellow of the California Academy of Sciences](#). The Academy Fellows are a governing group of over 400 distinguished scientists who have made impactful and outstanding contributions to the natural sciences. Academy Fellows are nominated by their colleagues and appointed by the Board of Trustees and are lifetime members of the group.

As detailed on SSU's [NewsCenter](#), Crocker's research centers on the ecology and physiology of marine

vertebrates, specifically the metabolic adaptations that allow animals to go for long periods without eating or drinking, and to hold their breath while exercising. Currently, Crocker is focusing on the endocrine stress responses, foraging success, and reproduction of marine mammals with the ultimate goal of better understanding how they respond to climate variability and anthropogenic stressors. He has received numerous grants from the National Science Foundation and other organizations and is extensively published.

### Students Need You ...

Tutor, Mentor, Teach, Present, Give, Share ... whatever works for you will help students navigate college. To learn about the possibilities contact:

Lynn Stauffer, Ph.D.  
School of Science & Technology, Dean  
Darwin Hall, Room 115  
707-664-2171

-or-

Michelle Covington  
Director of Development  
Stevenson Hall, Room 1054  
707-664-4151



# Teaching Excellence



**Dr. Lauren Morimoto**, Professor of Kinesiology, is one of two recipients of SSU's [2016-17 Excellence in Teaching Award](#). The award is given annually to at least one SSU faculty member who has made outstanding contributions to the education of the university's students. Morimoto is

undeniably passionate about education, inclusion, diversity, and creating a safe and welcoming atmosphere for everyone at SSU. For the past three years, she has served as the Director of Diversity and Inclusive Excellence at SSU, and she has helped advance the LGBT+ Safe Zone and Undocu-ally trainings for SSU faculty and staff since 2014.

Her teaching philosophy centers on engagement: fostering student engagement with course content; encouraging student engagement with each other and the professor; and promoting student engagement outside the classroom. She also believes that what she teaches her students won't matter to them until she can demonstrate to her students that *they* matter to her.

Her courses include Ethics, Inclusion and Equity in Coaching, and Women in Sport: Issues, Images and Identities in which she challenges her students to look at the world and people with different viewpoints. "I want students to care about the people they're working with. I always tell them, you're not working on bodies, you're working on people, so you can't just treat everybody like they have the same background," [said](#) Morimoto.

Morimoto received her Ph.D. of philosophy in educational policy and leadership and M.A. in education from Ohio State. She attended UC Berkeley where she received undergraduate degrees in dramatic arts and history. Prior to coming to

SSU in 2009, Morimoto held positions as a lecturer at CSU East Bay and as a visiting professor at Miami University of Ohio.



Every year, the Santa Rosa Chamber of Commerce honors local educators from pre-school to 4-year college levels with their [Excellence in Education Award](#). This year, **Dr. Jeremy Qualls**, Professor of Physics & Astronomy and SST's Director of Academic Resources, was selected as the outstanding educator at the 4-year college level.

Qualls has an impressive roster of innovative courses he's designed, including A Watershed Year, a yearlong First Year Experience course, and Dream, Make, and Innovate, a maker course. He also teaches a number of popular courses, including The Physics of Toys and The Physics of Martial Arts, the latter of which was developed along with Dr. John Sullins. A strong supporter and promoter of STEM, Qualls has received extensive funding from NSF to explore pathways to increase interest and retention in STEM subjects at SSU.

"I was very proud to be recognized for my work especially in promoting STEM education," [said](#) Qualls. Many of his friends and colleagues were in attendance at the Chamber's Education and Business Partnership Breakfast in support of Qualls when his award was announced. "Receiving this award while being surrounded and supported by my peers and friends was definitely a milestone event in my teaching career."

Qualls taught at Wake Forest University and the University of Texas prior to joining the SSU faculty in 2007.

# New Faculty in the School of Science & Technology



**Dr. Lisa Bentley** – Dr. Bentley joins the Department of Biology after spending 3 years at the University of Oxford as a postdoctoral researcher. As part of this work, she spent 7 months camping with her family and 25 field assistants along an elevational gradient

from the Andes to the Amazon in Peru, which certainly fulfilled her enjoyment of working in exotic locations. She also enjoys rock climbing, mountain biking, and cooking. Her research focus is on plant ecophysiology, community ecology, and ecosystem ecology. She received her Ph.D. from Texas Tech University and was a NSF postdoctoral fellow at University of Arizona. She was born and raised in Philadelphia, PA, and is the proud mom of two sons.



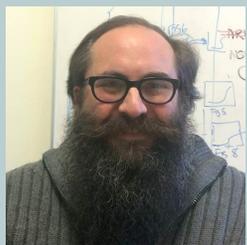
**Dr. Tammy Brunk** – Dr. Brunk received her Doctorate of Nursing Practice from Colorado Mesa University. For the past 18 years, she was a certified nurse midwife. She brings to the Department of Nursing a strong research background in adolescent health with

focus on contraceptive education and reproduction. She has a family of 4 children who range in age from 12 to 22.



**Dr. Martha Byrne** – Dr. Byrne comes to the Department of Mathematics & Statistics after spending the past 3 years as a visiting professor at Earlham College in Indiana. She grew up in New Mexico and received her Ph.D. from the University of New Mexico. As it so

happens, she hated math until she took calculus in her senior year of high school. She loves making things (jewelry, cloisonné), enjoys outdoor activities, and speaks Spanish. California is now the fifth state she's inhabited. She is excited to put down roots with her husband of 11 years and two young children.



**Dr. Mark Gondree** – Dr. Gondree joins the Department of Computer Science after working as a research assistant professor at the Naval Postgraduate School in Monterey. He received his Ph.D. from UC Davis and his research focuses on computer security, cryptography, and computer security education. He has recent NSF

grants related to using puzzles and games in security pedagogy. He was born in Buffalo, NY, where his parents still live. He is a board game enthusiast who enjoys the cinema, STEM outreach, and electronic privacy.



**Dr. Brendan Hamel-Bissell** – Dr. Hamel-Bissell received his Ph.D. from Stanford and brings to the Department of Engineering Science a strong research background in optical communications. He grew up in Vermont where he spent most of his time skiing including 6 years

as a member of the U.S. National Ski Patrol. Dr. Hamel-Bissell is passionate about supporting the LGBTQIA community and served on the Board of Directors of Stanford Pride.



**Dr. Bogdan Negru** – Dr. Negru comes to the Department of Chemistry after serving as a postdoctoral fellow at Northwestern. He received his Ph.D. from UC Berkeley, and his research focuses on nanoparticle substrates. Dr. Negru emigrated from Romania when

he was 15 and settled in Illinois. He likes to cook, eat, and enjoys the outdoors—especially camping and mushroom hunting. He is a woodworker and potter with a wife and two young sons.



**Dr. Jordan Rose** – Dr. Rose returns to the Department of Nursing as an assistant professor after serving as a lecturer in the department for the past few years. He received his Doctorate of Nursing Practice from the CSU Doctor of Nursing Practice, Northern California

Consortium. His research is in electronic health records and how technology can support health. He worked at the SSU Health Center as a family nurse practitioner, and as a RN and nurse informaticist at Healdsburg Hospital. He has lived in San Diego, London, and Japan, where he worked as an English teacher prior to his career in nursing. Outside of nursing, Rose loves to dive for abalone, camping, cooking, and DIY projects. He is the father to two energetic boys and an equally energetic dog.



**Dr. Krista Wolcott** – Dr. Wolcott returns to the Department of Nursing as an assistant professor after serving as a lecturer in the department for many years. She received her Ph.D. from UCSF and was a visiting professor at the Cicely Saunders Institute for Palliative

Care and Rehabilitation at King's College in London. Her research focuses on palliative care and end of life care issues, and her clinical background is primarily in critical care. She has worked as a nurse both domestically and abroad in a small hospital in southern Africa. Outside of nursing, Dr. Wolcott loves travelling, reading, waking, and painting.

# Electrical Engineering Student Helps Design and Build Chimpanzee Enrichment Devices

Undergraduate Taylor Jones spent the summer working on a project he probably never anticipated when he became an Electrical Engineering student: designing the building the motors and switches for enrichment devices for the chimpanzees at Oakland Zoo (figure 1). The project's primary investigator, Nicole Cornelius (MS candidate in Biology), aims to understand how enrichment complexity affects the behavior of highly intelligent animals living in captivity. For the first phase of the project, Taylor programmed an Arduino board to run a former vending machine motor to drop rewards into a puzzle feeder at pre-determined times. Chimps then move the reward through the device to obtain it (figure 2). For the second phase, Taylor designed and built an LED switch that allows the chimpanzees to run the enrichment device themselves. When a chimp drops a block into the device, it passes by and disrupts the LED light, which triggers the motor to release a reward. Taylor's contribution to this project was funded by a 2016-2017 RSCAP Mini-Grant awarded to Dr. Karin E. Jaffe.

—Dr. Karin E. Jaffe, photos courtesy of the author



Figure 1. Left to right: Darren Minier (Zoological Manager, Oakland Zoo), Nicole Cornelius (project PI), and Taylor Jones watch Oakland Zoo chimps



Figure 2. Two Oakland Zoo chimps investigate a puzzle feeder shortly after installation.



## 2016 Nichols Scholar

Nursing student Shauna Fassino has been named SSU's 2016 Nichols Scholar. Fassino is the president of the Nursing Club, a member of the Student Health Advisory Committee, volunteers with the student-run community service organization JUMP (Join Us Making Progress), and has maintained a 4.0 GPA throughout her college career. After graduating in 2017, Fassino plans to pursue a Master's degree in nursing and become a nurse practitioner.

The junior is largely motivated by her grandfather, who she tragically lost to a stroke last year. He supported and encouraged her dream of becoming a nurse. As quoted in SSU's Insights magazine, "I miss him every day, but it also gave me even more drive to become a nurse and help others... I want to help families in their most vulnerable state, and ultimately give back to the communities that have given so much to me throughout the years."



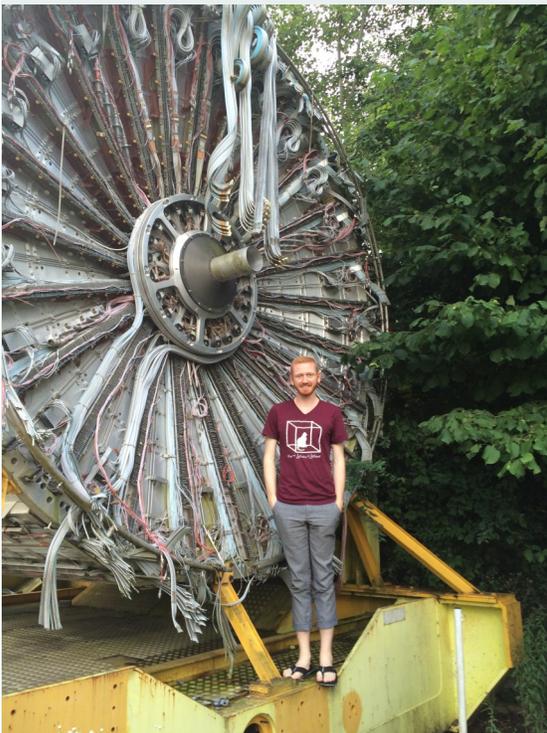
The Ambrose R. Nichols, Jr. scholarship was established and named for SSU's founding president and is awarded annually by the Alumni Association for outstanding scholastic achievement and contributions to the campus community. *Photo by Nicolas Grizzle.*

# CERN ATLAS Research

This past summer, Michael Dobbs, a physics and mathematics major from Sonoma State, was selected as an undergraduate researcher for an 8-week summer internship at the [European Organization for Nuclear Research \(CERN\)](#) near Geneva, Switzerland. Dobbs' amazing opportunity was the result of his participation in an online particle physics class taught by Fresno State physics professor [Dr. Yongsheng Gao](#) and a \$10,000 grant given by the NSF.

CERN is the largest physics laboratory in the world and home to the highest energy particle collider, [the Large Hadron Collider \(LHC\)](#). They are on the brink of discovering new physics that can explain dark matter, dark energy, and the origin of the universe. [The ATLAS \(A Toroidal LHC ApparatuS\)](#) detector is the largest on site at CERN and is composed of many types of detectors formed in a cylindrical arrangement that collect data on the shower of particles that originate from the proton collisions within the accelerator. It is also where the most recently discovered particle, the Higgs Boson, was first detected. This particle was theoretically predicted by Peter Higgs and Francois Englert over fifty years ago as an explanation for why fundamental particles have mass when they should be massless and has been a staple of many new ideas in the field.

Dobbs collaborated with Stanford physicists Zihao Jiang, Lauren Tompkins, and Michael Kagan on the characterization of an algorithm that detects b quarks. B tagging is an important process in capturing interesting events occurring in the ATLAS experiment. By analyzing how the computer algorithm learns from various amounts and types of input, Dobbs attempted to improve the efficiency of the capturing of data and background rejection. After 8 weeks of physics analyses, he concluded that two



Dobbs next to a large piece of particle physics hardware at CERN.

*Photo courtesy of Michael Dobbs.*

more variables could be added to the algorithm input without compromising the classification errors of the algorithm, thus increasing both the efficiency and rejection by ten percent.

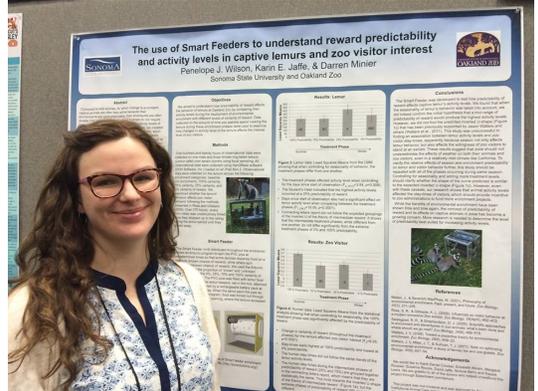
"It was such a wonderful experience," exclaimed Dobbs, "having such a large amount of physicists in the same area working on a large collaborative project; it harbors the formation of a tight-knit community of scientists working towards a common goal. I am grateful for the research opportunity offered by the [CSU NUPAC](#) program and appreciate all the time and effort put into it so that undergraduates from California can travel to Europe for the summer and work on such an amazing experiment."

—Michael Dobbs

Two Biology graduate students presented posters at the 2016 Annual Meeting of the Association of Zoos and Aquariums (AZA) in San Diego on September 10, 2016. Penny Wilson (M.S. in Biology awarded April 2016) presented the results of her work on how lemurs respond to environmental contingencies for acquisition of resources in her poster, "The use of smart feeders to understand reward predictability and activity levels in captive lemurs and zoo visitor interest".

Louisa Radosevich (MS candidate in Biology) presented preliminary results of her social network analysis of baboons in her poster, "Changes in social cohesion in a captive group of hamadryas baboons".

Both students are members of the SSU Primate Ethology Research Lab, and both projects were conducted at Oakland Zoo. —Dr. Karin E. Jaffe



Penny Wilson



Louisa Radosevich

*Photos courtesy of Dr. Karin E. Jaffe*

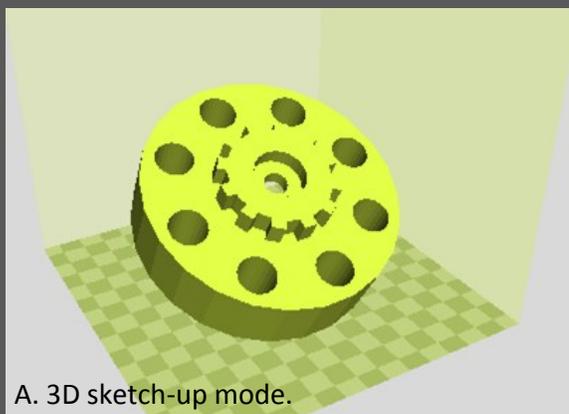
# SSU Receives Funding to Create Centralized Makerspace

What is a makerspace? Well, it turns out it depends on who you ask. In the simplest terms, it is a space where you create things. Humans are constantly in the state of creating things. Not just through specialized hobbies and arts, but almost all human endeavors have some stage of creation. If you want to eat, you need to come up with a plan—that peanut butter and jelly sandwich isn't going to spontaneously appear in your stomach. In a more encompassing definition, a makerspace is a dedicated place to come together as a community to address problems, come up with ideas, and create the solution.

In the case of figuring out what to eat, the makerspace is usually the home and kitchen. The hunger from an empty stomach becomes the basis of the problem. Then other factors are examined, such as the scale of the problem, who else might be hungry, what resources are available, and what has been done in the past. There is usually a community aspect that accompanies the problem: do I ask my parents for help? Do I get input from the others that are hungry? Will I do a Google search? Within the context of being hungry, you will ultimately come up with a solution and need to implement it. The kitchen has the tools and resources you need to address the specific issue of being hungry, and therefore becomes part of your makerspace. The makerspace is defined by many parameters but most importantly by the problems being addressed and the users of the space.

Recently, SSU received \$584,000 from the National Science Foundation to create a makerspace on campus and carry out investigations to determine the impact of having such a facility has on students. The program is led by the School of Science and Technology and is a partnership with the Schulz Library and other schools on campus. The principal investigators on the proposal are Dr. Jeremy Qualls and Dr. Lynn Cominsky. However, many faculty members from across campus are and will be involved.

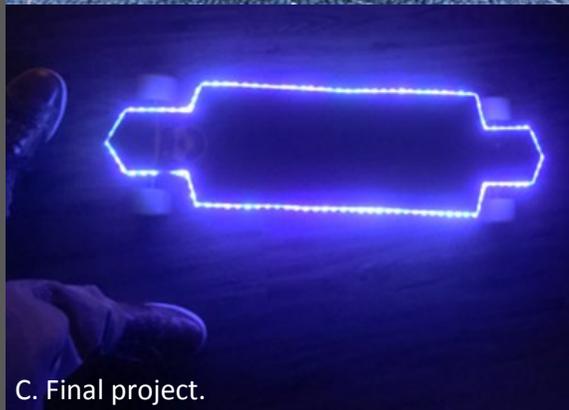
The SSU makerspace will be established within the Schulz Library and will serve the entire campus community. The proposal provides funding for three years. Within that time it will see the creation of a working makerspace, accompanying workshops and skills labs, a sophomore year experience course, and educational research into the impact of the makerspace. SSU already has a number of amazing programs on campus with a variety of specialized workshops in art, theater, and in the School of Science and Technology. The makerspace will serve as a hub with pathways to these programs as well as programs in our local community. The makerspace will start with rapid prototyping equipment such as 3D printers, laser cutters, and microcontrollers, and will be prepped to construct a variety of materials from plastics, metals, to clothing. The SSU makerspace will not be just for building, but also a place for dreams. It will be a localized center for researching, sharing, teaching, and exploring ideas. Currently, the PIs are in the formative stage of determining what the space will look like. The Maker course SCI 220: Dream, Make, and Innovate is being piloted this semester and the program is set to roll out in spring 2017. —Dr. Jeremy Qualls



A. 3D sketch-up mode.



B. Printed wheel/gear and Dynamo.



C. Final project.

Fig. 1: Example of recharging and illuminating prototype skateboard designed and built by SSU students Matthew Hargadon and Vern Fue.



Fig. 2: SSU students in experimental pilot maker class SCI 220: Dream, Make, and Innovate.

# Wine into Water: a Collaboration

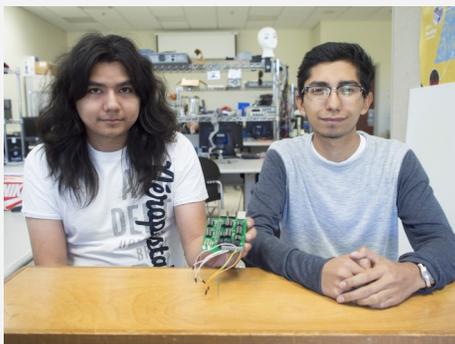
Wineries must deal with the cost and environmental impact of disposing the wastewater they produce. Racking and rinsing of wine barrels generates wastewater that requires thorough treatment due to its acidity and high level of organics. Some small local wineries pay to have their wastewater transported by tanker truck to the East Bay Municipal Utility District wastewater treatment plant in Oakland, which is both expensive and ecologically unsound.



Prof. Cohen (second from right) with his group of biology students.

The research groups of Prof. Michael Cohen in the Department of Biology and Prof. Farid Farahmand in the Department of Engineering Science are collaborating with the Biological Systems Unit at the Okinawa Institute of Science and Technology (OIST) in Japan to address this issue by testing an innovative wastewater treatment process at [D'Argenzio Winery](#) in Santa Rosa. Two years ago, Ray Johnson, Executive Director of the Sonoma State Wine Business Program, introduced Prof. Cohen to winery owner Ray D'Argenzio, who has enthusiastically supported the research project ever since.

The deployed pilot system is efficient, automated, and compact, allowing it to be housed onsite and thus lower the financial and environmental cost of wastewater treatment. Key to the system's performance is a novel tubular microbial fuel cell (MFC) technology developed at OIST, where Prof. Cohen recently spent one year as a visiting scientist. Wastewater flows from a holding tank into dual MFCs. Inside the serpentine channels of the MFCs bacteria digest and oxidize the organic material, such as ethanol and acetic acid, converting it to methane-rich biogas and electric energy, which is delivered to an internal conductive surface. The conductive surface takes the place of oxygen, thereby eliminating the need for the most energy intensive and costly part of wastewater treatment: aeration. The cleaned water flows from the microbial fuel cells to a sand filter as a final polishing step. From there it is used to irrigate some of D'Argenzio's landscaping.

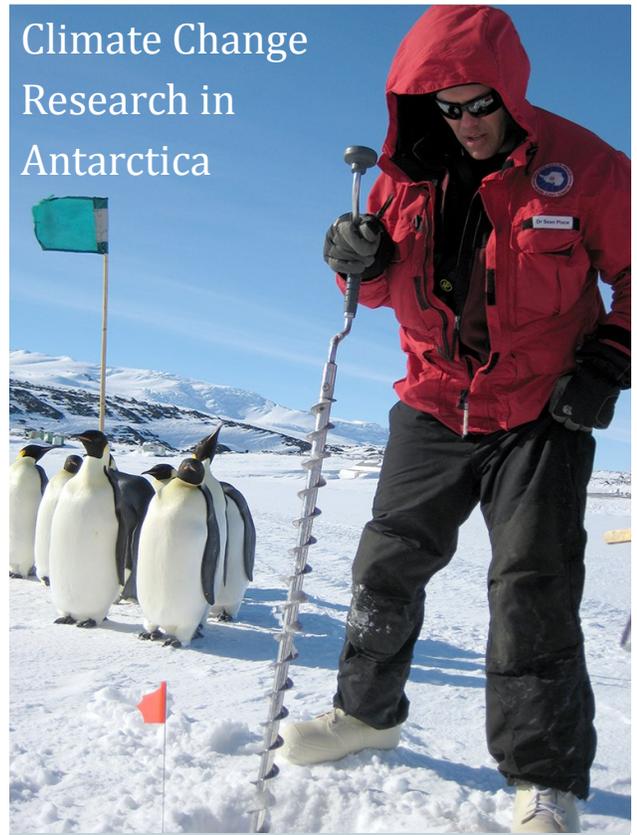


Omar Alvarez Tinajero and Aaron Marquez holding the prototype with Omar Alvarez Tinajero.

Students are now working on optimizing system operations and developing monitoring and control devices that will eventually allow for the unit to be controlled off site. Dr. Cohen asserts that the system has the potential to meet the total treatment needs of the winery within 5 years if the project's success

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# Climate Change Research in Antarctica

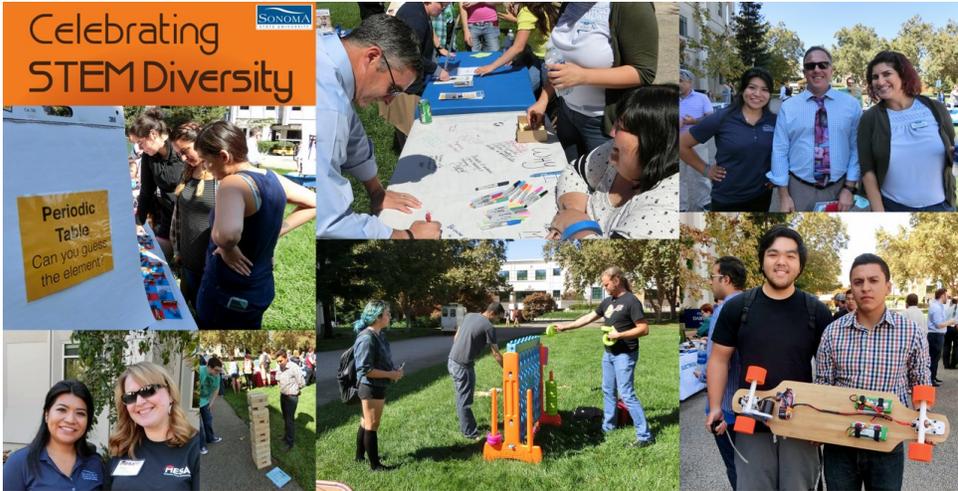


For years, scientists have been researching how climate change affects—and will continue to affect—our planet and its inhabitants. The research paints a pretty dire future if we don't implement positive changes. It is, however, inevitable that our planet will be changed in some way. Biology Professor Sean Place has received a \$618,000 National Science Foundation grant to study how climate change might affect species living in cold environments, including the possibility of any positive effects of a global temperature increase.

Place will head to Antarctica to study how temperature affects fish that have evolved in sub-zero water over millions of years. These fish are considered highly vulnerable to even the smallest temperature change. Adjusting to a temperature change is highly stressful for the fish and uses up energy that would otherwise be used for growth and reproduction. However, Place posits that warming water could make some of the fish's internal processes, such as protein folding, more efficient, thus freeing up much-needed energy for other uses.

"It's a bit controversial. Most people don't like to think of global climate change as having any benefits. But we know there will always be winners and losers with any change," [says](#) Place. He cautions, however, that even though there may be some benefit to various species on our planet, a global sea surface temperature rise can

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Race, culture, age, heritage, experience, background, ethnicity, and personal history all affect the way in which we interact with one another. Diversity makes our campus stronger!

On September 20, 2016, students, faculty, staff, and administrators from across campus joined together in celebration of diversity in Science, Technology, Engineering, and Mathematics (STEM). This event sought to expose students to the multicultural and multidisciplinary science community at SSU, promote student-faculty interaction, and attract students to programs, clubs, and majors in STEM. We learned. We played games. We met new friends and colleagues. We had fun!

Organizers and participants included MESA, EOP, LSAMP, SOURCE, McNair Scholars, MAP, United for Success, the President's Diversity Council, and the School of Science and Technology. Check out EOP's YouTube page for a [video](#) of the day. —Dr. Carolyn Peruta

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continues. Omar Alvarez Tinajero and Aaron Marquez, the Electrical Engineering students working with Prof. Farahmand presented their remote power monitoring system for the MFC at the 3<sup>rd</sup> Meeting of the North American Branch of the International [Society for Microbial Electrochemistry Technology](#) at Stanford in early October. Alvarez Tinajero, a recent graduate, has also been offered an internship position at OIST.



**S**  
**G**  
**T**  
**F**

Geology Professor Matty Mookerjee received funding from both NSF and the Structural Geology and Tectonics Division of the Geological Society of America to support the fourth biennial Structural Geology and Tectonics Forum (SGTF) which was held at Sonoma State University, California, August 1 through 3, 2016. Since its inception in 2010, the SGTF has brought the structural geology and tectonics community together to identify important science questions, help initiate collaborative relationships, foster the development of early career investigators, introduce graduate students to potential post-doctoral advisors and employers, and organize around specific community issues (e.g., cyberinfrastructure, diversity, etc.). The forum consisted of technical sessions, short courses and workshops, and field trips to local geological sites of interest. This conference rotates between larger research and smaller undergraduate institutions. Sonoma State University is a relatively small public university and the only California university that is a member of the Council of Public Liberal Arts Colleges. —Dr. Matty Mookerjee

Right: SGTF attendees in the field and viewing participant research posters. Photos courtesy of Prof. Mookerjee.





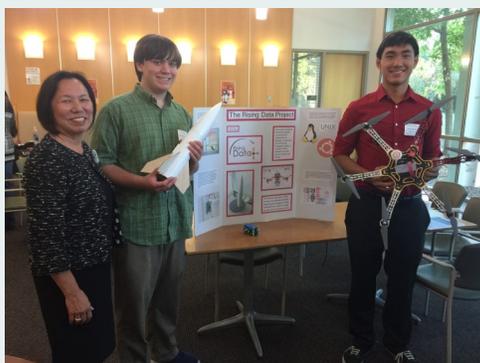
The Summer High School Internship Program ([SHIP](#)), a collaboration of the Sonoma County Office of Education and the School of Science and Technology at SSU with generous support by do-



Dr. Suzanne Rivoire, Dean Lynn Stauffer, Superintendent Steven Herrington, and President Judy Sakaki

nors, culminated in the Fall 2016 SHIP Symposium in September. President Judy Sakaki and Superintendent Steven Herrington joined Dean Lynn Stauffer and SHIP Coordinator Dr. Suzanne Rivoire in giving welcoming remarks. Fifteen interns and two volunteers presented the research they conducted over the summer

by producing a research poster and giving a formal talk. Each intern and volunteer spent at least 160 of their summer hours in the lab alongside SSU faculty mentors and students. This year, research projects in the disciplines of astronomy, biology, chemistry, computer science, engineering science, environmental studies and planning, kinesiology, nursing, and physics were explored. This was the program's eighth year and its largest group to date. Thank you to the faculty mentors and SSU students who participated in this program.



President Sakaki, Brendan Quinlan, and Kenneth Shinn

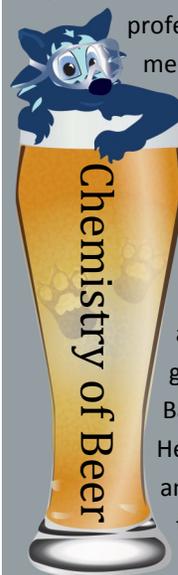
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ultimately be negative. This has already been seen in the decline in our oceans' pH levels. This pH change has resulted in the dying of coral, oysters, and other creatures, and may very well negate any positive gains the fish make.

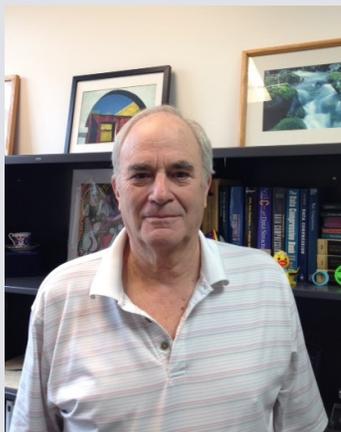
Another aspect of Place's research is investigating the possibility that the fish, after millions of years, have lost all capability to respond to a rapid temperature increase, something that is known as heat shock response. It's been proven that other species have lost their heat shock response. If the loss of heat shock response is proven common among Antarctic species, the negative effects of global climate change may be greater than previously thought for the larger ecosystem.

This will be Place's sixth trip to Antarctica. He will spend two seasons in McMurdo Station, where graduate and undergraduate students will join him in his research.

The [Chemistry Department](#) hosted world-renowned brew scientist Professor Charles Bamforth on Monday, September 26, 2016. Bamforth is currently the Anheuser-Busch Endowed Chair of Malting and Brewing Sciences and a Professor of Food Science and Technology at UC Davis. His research focuses on the wholesomeness of beer and is known for his analysis of foam. Bamforth has written a number of books on beer. Our favorite title is *Beer is Proof God Loves Us*. Prior to giving his talk, he spent the day visiting with students and professors in the chemistry department. The talk he gave was brilliant and engaging and was accessible to all members of the SSU and local community but had just enough chemistry. After his talk, Bamforth stayed for a beer tasting and answered questions from our guests. We want to thank Dr. Bamforth for a great event, and Henhouse, Fogbelt, Lagunitas, and Plow breweries for donating the beer. —Dr. Carmen Works



# SST Spotlight

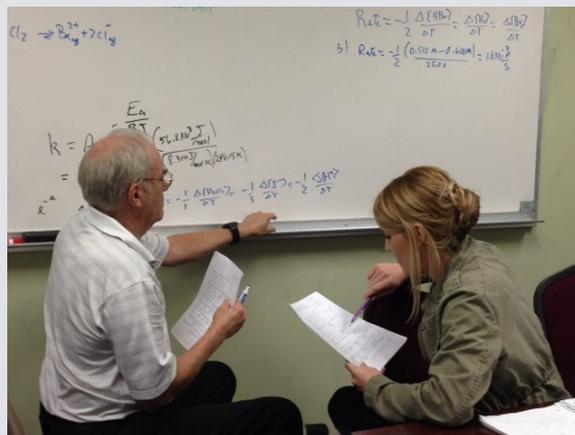


**Dr. Professor Emeritus Don Marshall**, left, is currently in his fiftieth year working in the Chemistry Department at SSU. Although officially retired from the university for the past fifteen years, Marshall volunteers three mornings every week of the academic year to tutor chemistry students.

Marshall says he decided to continue working with students in his retirement because he enjoys solving problems and seeing students learn—plus it gets him out of gardening at home. He enjoys it because there is no grading or exams, so he is able to completely focus on the students. “It’s nice to see the ‘A-ha!’ moment, the look on students’ faces when they get it,” said Marshall.

Marshall received his B.A. in chemistry from UC Davis, his M.S. in chemistry from University of Nevada at Reno, and his Ph.D. in chemistry from Washington State University. His areas of research and interest are analytical, inorganic, and environmental chemis-

try. He started at SSU in 1966, back when it was known Sonoma State College and campus looked very different. “I interviewed in a hardhat because they were still building Darwin [Hall],” Marshall remembers.



When he’s not tutoring, Marshall enjoys travelling. Through Global Volunteers, he’s travelled to Tanzania, the Cook Islands, Costa Rica, Peru, St. Lucia, and China where he’s taught both chemistry and English. He also volunteered in Haiti with Foundation for Peace. He will be embarking on a two week excursion to Hanoi, Vietnam in November where he will teach English.



Dale, Kate, and Elise Ann Abrams

Science & Tech alumni are pursuing a variety of endeavors. **Dale Abrams**, who graduated in 2007, is using his background in computer science (B.S.) and mathematics (minor) in the Hardware Test Engineering division at Apple. In his senior software engineer position, he develops testing systems for Apple hardware products being manufactured in factories around the world. Prior to Apple, Dale worked as a tech lead, manager, and independent contractor. His contracting work included time with Apple’s Online Store developing CMS software and a member portal for Apple consultants.

Outside of work, Dale and his wife Kate go big when it comes to major life events. They both changed jobs within 4 weeks of getting married in 2012, and this year they purchased and renovated a house 10 days after giving birth to their first child, Elise Ann. We are so proud!

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*What is your greatest takeaway from your studies at SSU?*

**Dale:** Working in the tech industry means that I’m constantly presented with complex challenges and the need to learn and effectively put into practice new languages and technologies. Even though these languages and technologies didn’t necessarily exist when I was in school, I draw on my experience from Sonoma State regularly to tackle them. Specifically, I came away from SSU with a framework for learning, evaluating, problem solving and putting new skills into practice that has been invaluable both in my professional and personal life.

*What advice do you have for today’s students in the School of Science & Technology?*

**Dale:** Show up to every class, participate as much as possible and really throw your back into exceeding the goals of assigned work. Take advantage of the safe environment to try (and sometimes fail). As you are making your way through the program, try to take note of areas that really interest you and continue learning outside of assigned course work. This will ultimately serve you well when it comes time to look for a job after college. Employers love to see you’re passionate about your work and that you’re willing to go above and beyond expectations.



# The Computer Science Department Today

Enrollment in the [Computer Science program](#) has almost tripled since Fall 2010, from 126 students to today's 330. In response to the increase in enrollment, the Department offers its courses more frequently, which gives students more flexibility when planning their semesters. In addition, we have hired two new tenure-track faculty members in the past two years, Dr. Gurman Gill in Fall 2015 and Dr. Mark Gondree in Fall 2016. Our last tenure-track hire prior to Dr. Gill's was in 2008. In addition, we are conducting a new search to fill a tenure-track position this academic year. We greatly appreciate the support that we have received from our School and the University in this regard.

According to the Department of Labor's Bureau of Labor Statistics, "Employment of computer and information technology occupations is projected to grow 12 percent from 2014 to 2024, faster than the average for all occupations." To cite a few statistics, the median of salary for computer programmer, database administrator, and software developer in 2015 was \$79,530, \$81,710, and \$100,690, respectively. Software developers design software systems whereas computer programmers turn the design into code.

As you would expect from the above statistics, the market for Computer Science graduates is very good. A large number of our students have internships and part-time jobs during both summer and the regular semester (PG&E, Lawrence Livermore National Laboratory, IBM, Microsoft, Amazon, etc.). These internships and part-time jobs often lead to permanent employment. The number of students who receive job offers early in their senior year has noticeably increased.

The department's faculty continue to involve students in research projects. Some of these activities are funded and others fulfill course requirements, such as directed studies or the capstone experience. Students can conduct energy efficient computing projects with Dr. Rivoire; efficient algorithm design, audio and EEG signal processing and machine learning with

Dr. Ravikumar; classification techniques for neuroimaging with Dr. Gill; computer security with Dr. Ledin; and data mining and visualization with Dr. Kooshesh.

We are currently in the process of reviewing our program. This involves a close study of our program, our curriculum and its adherence to the ACM/IEEE Computer Society's Computer Science Curricula, the effectiveness with which we use our resources, and the future direction of our program. In the course of this program review, we will also very likely make changes to our curriculum. We therefore welcome any suggestions that our alumni or the professional communities that we serve might have for us to consider.

—Dr. Ali Kooshesh



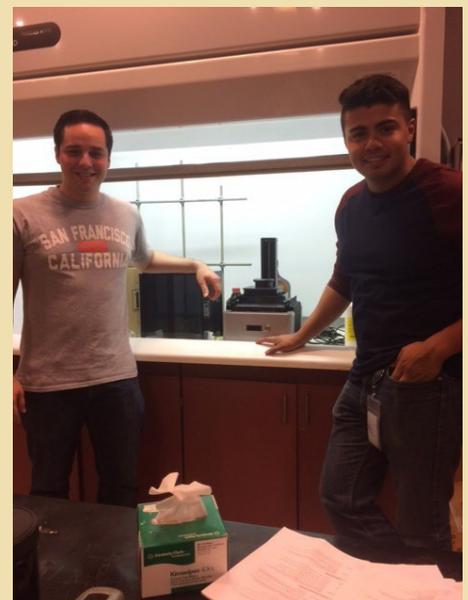
## 3D Printing

Guided by Visiting Professor Derek Decker, Engineering Science students Nader Srouji and Michael Vargas were able to activate a resin-based 3D printer provided by Professor Jeremy Qualls.

In addition to learning many new skills (3D design in Fusion360, photochemistry, writing G-Code, accurately measuring gaps less than a tenth of a millimeter, and making polydimethyl siloxane-filled resin trays) they produced a microfluidic device with millimeter-sized channels from a liquid resin that UV cures to a stretchy elastomer using a scanned laser. The students said this "was a great experience" and they "would definitely recommend this experience to anyone who would like to learn about 3D printing".



The created device.



Nader Srouji and Michael Vargas.

On the same day of the SSU Symposium of Research and Creativity, the Biology Department hosted a reception for their alumni and emeritus faculty. Alumni and emeritus faculty joined current students, staff and faculty in the lobby of Darwin Hall to enjoy refreshments while catching up and viewing student research posters. It was a decidedly momentous evening with over 100 attendees.



Dustin Howland talking about his research to a group of onlookers.

The students presenting posters all received research support from the Professor Jack Arnold Memorial Fund. This fund was set up in memory of Professor Jack Arnold who founded the Division of Natural Sciences at Sonoma State, now known as

the School of Science and Technology, and was responsible for establishing the Department of Biology. The fund honors Professor Arnold's wisdom and leadership and supports the department's legacy of excellence and signature hands-on research experiences for undergraduate and graduate students in Biology.



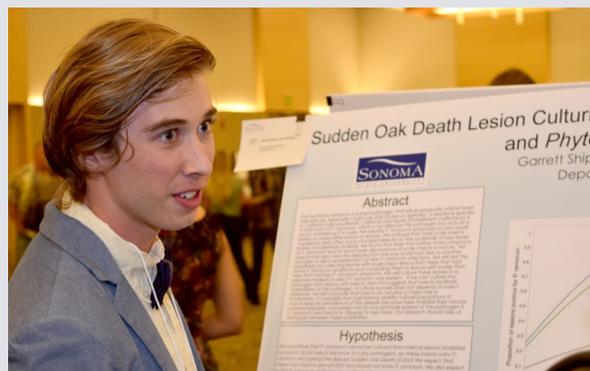
Sam Horton and Professor Emeritus Phil Northen

The department hopes to organize similar reunion events in the future, so stay tuned! In the meantime, we encourage you to view the department's [colloquium schedule](#) and consider attending one of the lectures listed therein.

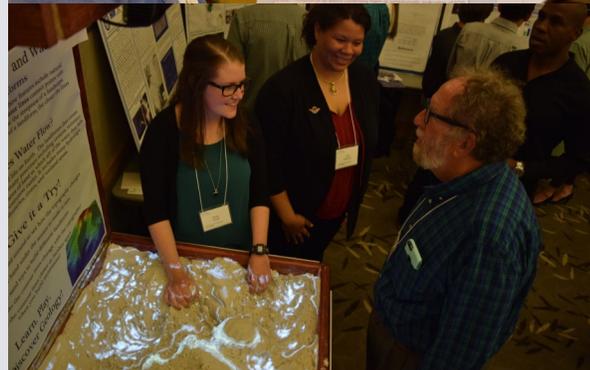
For the Science Symposium's fourth year, the School of Science and Technology and the WATERS Collaborative partnered with the SSU SOURCE Office and the McNair Scholars and joined the SSU Symposium on Research and Creativity. Students from across campus and all disciplines presented their research posters. There were over 160 total poster presentations; 117 of the posters were from the School of Science and Technology.

The event was once again kicked off with oral presentations by the Science 120 cohort. The oral presentations were followed by the poster presentations in the Student Center's Ballroom where judges evaluated the posters chatted with the presenters. The event culminated in the awards ceremony, which opened with welcoming remarks by former President Ruben Armiñana and former Provost Andrew Rogerson. Deans Thaine Stearns, Lynn Stauffer, and John Wingard presented the Best Poster Award for the Schools of Arts and Humanities, Science and Technology, and Social Studies, respectively. For SST, Betsy Smith won for her poster "Spatial & Temporal Variability of Winter Accumulation on Taku Glacier, Southeast Alaska between 2012 & 2015" (advisor: Dr. Owen Anfinson, Geology). Three additional awards were given by SST: Blanca Arango won the Big Picture Award for her poster "Eggshell Porosity Value on Western Pond Turtle *Emys marmorata*" (advisor: Dr. Nick Geist, Biology); Justine Gray won the Big Idea award for her poster "Cloning and Characterization of Hemicellulose—Degrading Enzymes from *Cellulomonas* sp. Strain FA1" (advisor: Dr. Michael Cohen, Biology); and Betsy Smith and Julia Freeman won the People's Choice award for their poster "Topographic Interactive Model: Augmented Reality Sandbox" (advisors: Dr. Matt James and Phil Mooney, Geology).

It was another decidedly impressive year. The level of research and depth of knowledge shown by the students was outstanding. We're looking forward to another great Symposium in 2017! Hope to see you there.



Garrett Shipway. Photo by Nicolas Grizzle.



Betsy Smith, Julia Freeman, and Jake Mackenzie. Photo by Nicolas Grizzle.



Have you spotted the Lobos in this edition of the newsletter? You can view them all and more here:

[www.sonoma.edu/scitech/images/LoboTcards.jpg](http://www.sonoma.edu/scitech/images/LoboTcards.jpg). Thank

you to the talented Aurore Simonnet of the SSU E/PO Group for creating them!

