

Volume 4, Issue 2

March 23, 2015

Welcome to the Spring 2015 issue of our Science & Tech newsletter! It has been another exciting semester in the School and I am delighted to share the successes of our students and faculty. Student success is a top priority for our School with efforts at all grade levels to support student progress toward graduation, career and successful lives beyond the university.

Our students are excelling at regional, statewide and national levels. Three cross-disciplinary teams of SSU students competed in the recent CSU Innovation Corps (I-Corps) Student Challenge at the 27th CSU Annual Biotechnology Symposium. SSU team *PD Analytics* won with their low-cost device quantifying tremors associated with Parkinson's disease (highlighted later in this issue).

Industry is taking notice and we are building partnerships with companies to benefit students and those companies. These following examples just scratch the surface of the valued partnerships propelling our School forward. Dr. Gee with Raydiance, Inc. is working with Physics majors on their senior capstone projects. Hoji Alimi, an SSU Distinguished Alumnus, is partnering with Biology faculty to provide biotech internship opportunities. Keysight Technologies continues to support our engineering programs through equipment donations and collaborations. Our Nursing programs rely on an extensive network of clinical partners to provide clinical training for future nursing professionals.

We are also committed to bringing local, state and federal grant awards to support student and faculty efforts. These funds ripple through the School and out across our community and region. See inside this issue to learn more about the \$1.5 million project led by Dr. Ben Ford in partnership with Santa Rosa City Schools and the

California Mathematics Project: North Coast to design and implement Maker activities in K-8 mathematics. Dr. Lynn Cominsky's *i3 Learning by Making* program is bringing science-driven computational-thinking integrated STEM curriculum to six Mendocino County high schools. We are also partners in the Northern California Career Pathways Alliance to address workforce needs in science and technology by encouraging strong technical education and training in K-12.

Our School's instructional enrollment was close to 2300 students in Fall 2014, and we continue to graduate nearly 400 every year with bachelor's and master's degrees. The Kinesiology and Nursing programs annually have over 200 graduates.

We are excited to have six new tenure-track faculty (Biology, Computer Science, Geology, Kinesiology, Nursing, Physics & Astronomy) joining our School this coming fall. Watch for introductions to these new members of the Sci & Tech team in the next newsletter.

The CSU has launched a campaign this year to celebrate 3 million CSU alumni worldwide. All alumni from the 23 campuses are invited to join the world's largest [yearbook](#). I encourage our alumni to check it out and share their stories.

Much of what we do in Science & Technology would be impossible without the dedication of our faculty and staff and committed support from our alumni and donors. This commitment is at the core of ensuring student success. I am delighted to partner with Michelle Covington in Sonoma State's Office of Development to share our funding priorities. Contact me (lynn.stauffer@sonoma.edu) and/or Michelle (michelle.covington@sonoma.edu) (continued on next page)

(continued from front page) to explore partnership and investment opportunities.

Looking forward, this spring is on track to breaking records for student success and achievement – very exciting times! Our Science Symposium showcasing undergraduate and graduate research is on Thursday, May 7, 5:30-7pm. Come join us in the SSU Student Center Ballroom and learn more about what our talented and hardworking students and faculty are up to!!

Happy reading and happy spring,

Lynn Stauffer, Dean
School of Science & Technology



Prevention. Wellness. Access.

How Buzzwords Become Reality

Focusing on health and well-being is very real for the Healthcare Foundation of Northern Sonoma County, whose mission is to keep quality healthcare close to home. Investing in their community, the Healthcare Foundation secures funding and provides grants to local clinics, the Healdsburg District Hospital and educational programs. The Nursing Department at Sonoma State University (SSU) is one of those programs.

For the second year, the Healthcare Foundation has supported SSU master's level Family Nurse Practitioner (FNP) students who live in Northern Sonoma County and have an interest in continuing to serve that community. Through two separate and significant scholarships, the Healthcare Foundation is putting more FNPs to work *for you*. One scholarship provides tuition and books for an FNP student's final year while the other supports an FNP student's final semester.

Family Nurse Practitioners are registered nurses who go on to receive advanced education and clinical training that permits them to diagnose and treat acute and chronic conditions in the primary care setting with a focus on prevention and health maintenance.

The number of FNPs in California doubled between 2004 and 2008, and the demand for them continues to rise as doctors retire, the population ages and more people seek access. "As a community, we can help bridge the gaps in prevention, wellness and access to ensure a healthy community," said Pat Callahan, executive director of the Healthcare Foundation.

To become involved with Nursing at SSU please contact Michelle Covington, University Development at michelle.covington@sonoma.edu or 707-664-4151.

—Michelle Covington

Harmonious Equations: A Mathematical Exploration of Music

Wednesday, April 8, 4:15-5:30 pm; cookies & coffee at 3:45
Schroeder Hall, Green Music Center, Sonoma State



Clockwise from top left: Elizabeth Joy Roe, Dr. David Kung, and Sæunn Thorsteinsdóttir.

This year's Mathematics Festival—held every year in April, which is Mathematics Awareness Month—will feature a special M*A*T*H Colloquium talk on the Mathematical Exploration of Music in the Green Music Center's Schroeder Hall. Dr. David Kung, mathematician and violinist, will team with Elizabeth Joy Roe (piano) and Sæunn Thorsteinsdóttir (cello) of SSU's Trio Ariadne, to explore some of the amazing

connections between math and music: the mathematical study of a single vibrating string unlocks a world of musical overtones and harmonics—and even explains why a clarinet plays so much lower than its similar-sized cousin the flute. Calculus, and the related field of differential equations, shows us how our ears hear differences between two instruments—what musicians call timbre—even when they play the same note at the same loudness. Finally, abstract algebra gives modern language to the structures beneath the surface of Bach's magnificent canons and fugues.

Throughout the talk, mathematical concepts will come to life with musical examples played by the speaker and musical guests.

RSVP required: Call the Mathematics and Statistics Department at 707-664-2368 or email math@sonoma.edu. Department alumni should also plan on attending the alumni and awards dinner following the talk! —Ben Ford



SSU Team Wins CSU I-Corps Challenge

Congratulations to SSU undergraduate students Campbell Smith (Electrical Engineering), Mitchell Hickey (Business Administration/Financial Management), Janene Grippi (Kinesiology), and Luis Reyes (Electrical Engineering) who won the [2015 CSU Innovative Corps \(I-Corps\) Challenge](#) at the [27th CSU Annual Biotechnology Symposium!](#)

The I-Corps Challenge program is for CSU student teams investigating a biotechnology research-based idea. Teams are to interview potential customers and partners and think creatively to find a problem-solution fit based on their original idea. Teams that are accepted into the challenge receive a \$2500 microgrant to help with producing and implementing product concepts. Teams also attend webinars to learn about the customer discovery process, business model canvas concepts, business communications, legal and biotechnology regulatory issues. The Challenge culminates at the CSU Annual Biotechnology Symposium where participating teams present their product prototype.

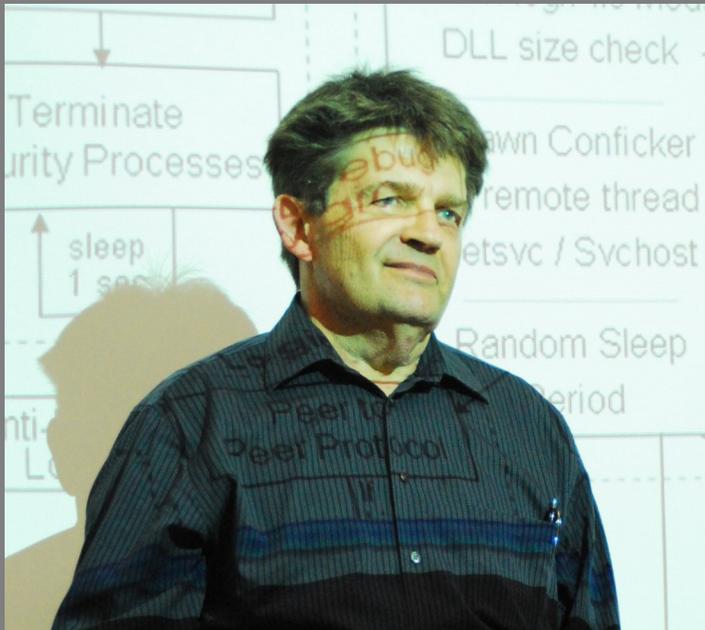
Eleven student teams presented at the final round of the I-Corps Challenge. Each team participating was evaluated on the follow-

ing: the amount of learning it accomplished over the course of the Challenge; the clarity of its product concepts; and justification of its problem-solution through customer discovery findings. SSU's cross-disciplinary team presented its product prototype PD Analytics. PD Analytics is a low cost device used to quantify tremors associated with Parkinson's disease. In the several months preceding the Symposium, the PD Analytics team used what they learned from the webinars and various trainings sessions with commercialization and industry professionals to interview potential customers and Parkinson's patients. They also built a working prototype and conducted the first phase of customer discovery.

Each member of the winning PD Analytics team will receive a scholarship that can be used towards educational expenses. The team is also eligible to apply for the 2015 National Grand Challenge to receive \$50,000 in startup money to fully develop their product. Dr. Farid Farahmand, Professor of Engineering, and Dr. Kirsten Ely, Professor of Entrepreneurship and Accounting, serve as the team's technical and entrepreneurial advisors, respectively. —Cory Oates

Thirty Years of Malware

Dr. George Ledin, Professor of Computer Science, has taught his malware class at SSU every spring since 1984. Ledin, his course, and his students have been the subject of numerous articles in [local](#), [national](#), and [international](#) publications. After 30 years, he's still attracting media attention and has no plans of stopping any time soon—much to the ire of antivirus software companies such as McAfee and Norton.



Dr. George Ledin. Photo Copyright © 2009, Roger Mamer. All Rights Reserved .

In the recently published *North Bay Business Journal* piece titled, "[Malware: Software with malice](#)," Ledin explains that he means no harm by teaching students how to write code that will get past antivirus programs. He believes that students who know how to write malware will be instrumental in creating effective software to stop it. As he puts it, good prosecution lawyers work stints as defense attorneys. In fact, many virus-fighting companies hire Ledin's students because they know the importance of someone who can think—or rather hack—like the enemy.

Not everyone in the antivirus business is happy about what Ledin is doing, though. In a world where cyber-attacks are growing at a seemingly exponential rate, some antivirus software companies don't believe we need to flood the malware writers' market. We shouldn't risk the possibility of training the next malware mastermind. Plus, McAfee insists that they are always one step ahead of the hackers. But if a college undergraduate can get around their software, a determined and talented code writer can certainly do so as well.

The intent of hackers has changed over the years. Hackers, at first, were participating in a sort of cyber hijinks—albeit their mischief-making was quite annoying and frustrating for the victim. Hackers 30 years ago were writing code that would erase files or completely destroy a computer. They were vandals looking for bragging rights. Now they've become much more sinister. Take, for example, the recent Sony Pictures Entertainment hack where hackers stole terabytes of highly sensitive information and the Target data breach where attackers pilfered millions of people's financial information. Hackers are looking to expose, threaten, and profit. Even scarier, the hackers are no longer just genius teenagers; countries and government-backed hackers are now waging cyber-attacks.

The malware being written is increasing in complexity and ability, just like the technology it's being used to infect, and this new age of malware is terribly exciting for Ledin. As quoted in the *North Bay Business Journal*, "Kicking and screaming, they will be burying me, saying, 'wait a second, there is new malware I have to investigate' ...A hundred years ago, none of this existed. Computer science refuses to stand still even for a moment." —Cory Oates

Excellence in Scholarship



Dr. Suzanne Rivoire

Drs. Lynn Cominsky, Professor and Chair of Physics and Astronomy, and Suzanne Rivoire, Associate Professor of Computer Science, have both been selected as recipients of the 2014-2015 President's Excellence in Scholarship award.



Dr. Lynn Cominsky

The award serves to recognize outstanding scholarship, commitment to student participation in research, and creative approaches for making scholarship available beyond the academic community. The award is granted to faculty who are exemplars of the teacher-scholar model at Sonoma State University.

Cominsky and Rivoire, along with their fellow awardees, will receive their awards at the First Annual University Research Symposium on April 15, 2015. Recipients of this award will also receive grant funds to support their continued efforts in scholarship, research, and educational excellence in the classroom.

Breathing in a box: Constraints on lung ventilation in giant pterosaurs



Artwork by Mark Witton.

Dr. Nicholas Geist's recently published paper in *The Anatomical Record*, and featured on *National Geographic's* "Phenomena: Laelaps," focuses on large pterosaurs and explores the mystery of how they breathed. Pterosaurs are close cousins to dinosaurs and the first known vertebrates to fly. They were small creatures at first, but the pterosaur order eventually grew to include larger species, such as the *Quetzalcoatlus* with a wingspan of over 33 feet.

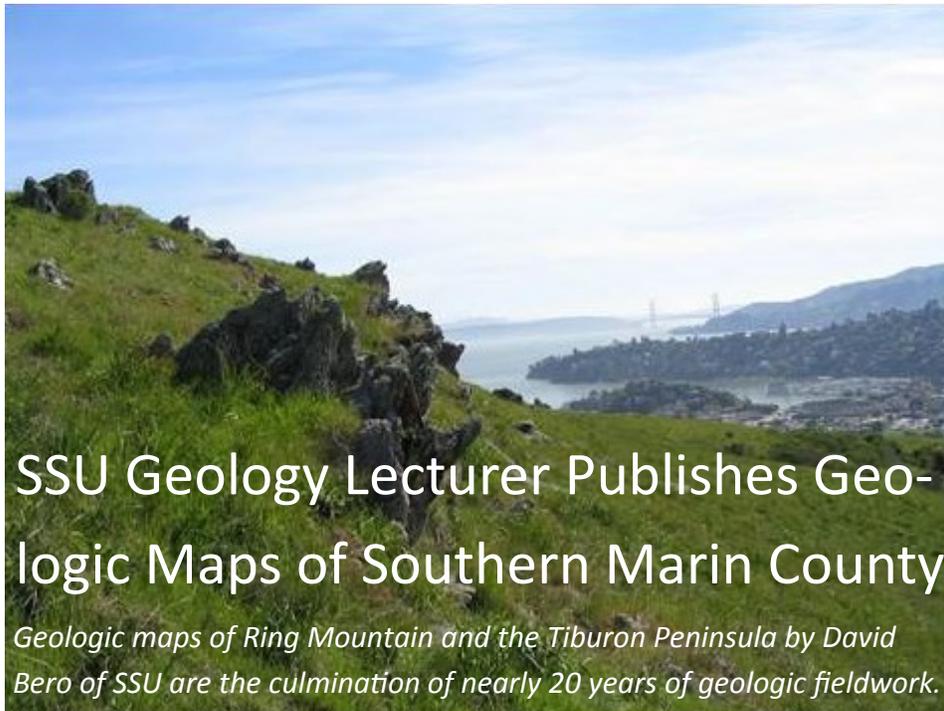
Although much is known about the structure of pterosaurs thanks to fossilized skeletal remains, certain biological functions still remain a mystery since the soft tissue has long since deteriorated. Because large pterosaurs have a rigid torso and their vertebrae were fused "into a stiffened rod of bone that was reinforced by a 'dense latticework of mineralized tendons,'" and their larger ribs

were fused to their vertebrae, how they breathed is not immediately evident (Switek).

Geist and colleagues looked to the living relatives of pterosaurs—crocodylians—and postulate that this could be how large pterosaurs breathed. Crocodylians—alligators and crocodiles—breathe by way of a hepatic piston. Their lungs and viscera are separated by their liver. The liver squishes down the viscera to make room for the lungs to expand downwards. Side muscles then contract to bring the liver back up to compress the lungs and exhale.

You can read the full paper, *Breathing in a box: Constraints on lung ventilation in giant pterosaurs*, by Geist, N. R., Hillenius, W. J., Frey, E., Jones, T. D. and Elgin, R. A., [here](#). You can read Brian Switek's *National Geographic* piece, "How Pterosaurs Filled Their Lungs," [here](#).

—Cory Oates



SSU Geology Lecturer Publishes Geologic Maps of Southern Marin County

Geologic maps of Ring Mountain and the Tiburon Peninsula by David Bero of SSU are the culmination of nearly 20 years of geologic fieldwork.

Geologists around the world are known for their love of the outdoors. David Bero, who has been lecturing in the Department of Geology at SSU for the last 8 years, is no exception. He has spent nearly every weekend during the last 20 years hiking the trails and enjoying the sweeping vistas of Marin County, CA. What distinguishes him from the multitude of people recreating on the same land is his intense focus on the rocks beneath him. Bero doesn't just go out for hikes and wander aimlessly along the trails. His mind is active, his practiced eye notices small details, and he routinely stops to examine rocks with a small magnifying glass. In short, he's out conducting geologic field work.

"I have lived and worked in the Bay Area for much of my career," says Bero, a resident of southern Marin. "Not all geologists are fortunate enough to have world-class geologic localities right out their front door. I have always been drawn to the beauty of Marin County and the rocks of the Franciscan Complex underlying the area. That combination has kept my interest and has remained my research focus for over two decades."

The rocks of the Franciscan Complex that Bero speaks of compose the remnants of an ancient subduction zone, which is the type of plate boundary where oceanic crustal rocks are pushed down to great depths beneath a continent, in this case the North American Continent. During this process, the rocks that Bero studies were altered (metamorphosed) by increasing heat and pressure and later moved back toward the surface along a series of complex faults. Sometimes during this process, rare and very ancient rocks composed of unusual minerals, called high-grade metamorphic blocks, are found associated with these previously subducted rocks. "The unique thing about Ring Mountain is the concentration and variety of the high-grade metamorphic blocks that occur there," says Bero. "The variety of temperature and pressure conditions recorded by these metamorphic blocks has made this area a key laboratory for a better understanding of the subduction process."

Over the years various geologists have worked on a number of projects attempting to sort out the geologic details of Ring Mountain and Tiburon Peninsula

area; Bero is one of them. "I've spent many days out there during the past 20 years mapping and trying to sort out the variety of rock types and multiple fault offsets that have occurred there which represent about 160 million years of local earth history. I hope that these geologic maps and accompanying report will be useful for those in the geologic community considering, or actively involved in research in the area, as well as those teaching or leading field trips in one of the classic areas of the Franciscan Complex."

Bero's geologic maps of both Ring Mountain and the Tiburon Peninsula, as well as a detailed report on the geology and structure of the area, Map Sheet 62, can be purchased on the California Geological Survey's [website](#). —Phil Mooney

GEEK WEEK 2015

Geek Week is an event supported by the math and science clubs of Sonoma State University to bring together and unite the geeks. Tabling by each club, various games, and even fundraisers occur during the week. The games are included as part of the Darwin Cup, and each year's winner gets the Official Darwin Cup Trophy engraved with their club's name to display in their respective display case!

Geek Week 2015 took place Sunday, March 8 through Friday, March 13 this year. Clubs competed in dodgeball, a water relay, potato sack races, catapults, the limbo, and the egg drop. Throughout the week, clubs hunted for symbols that were hidden in Darwin Hall, and conducted a food drive. And, of course, in celebration of Pi Day, SST professors volunteered to have pies thrown at them.

The Engineering Science Club took first place this year. The Chemistry Club and the Physics and Astronomy Club won second and third, respectively.

2015 Science Symposium



May 7, 2015
Student Center Ballroom

FYE Research Talks at 4 pm
Poster Session and Reception at 5:30 pm



Registration for presenters:
March 23 to April 22

The Symposium showcases the research achievements of students from the School of Science and Technology and WATERS Collaborative. Best Poster Awards are presented in five categories. An hors d'oeuvres buffet will be served along with the poster presentations.

Come vote for your students and friends!

Talk to students about their research experiences!

Celebrate science!

The Symposium is open to ALL SSU students, staff, faculty and members of the public.

Proudly presented by



www.sonoma.edu/scitech/symposium

Join us for the third annual SSU Science Symposium on May 7! All SSU students, staff, faculty, and members of the community are welcome to attend and enjoy an hors d'oeuvres buffet.

Last year, there was a total of 68 poster presentations and over 200 attendees. This year, we're incorporating a smartphone enabled voting system so that we can include two new awards categories: Faculty's Choice and Student's Choice. Other awards categories this year are Dean's Choice, Best Poster Over-All, and Best WATERS Poster. So, come vote for your friends and students, enjoy some tasty snacks, and learn about students' research!

If you would like to register to present at the Symposium, registration will be open March 23 through April 22. Please visit the Symposium [website](#) to register and find out more information.

The Symposium is proudly hosted and supported by the School of Science & Technology and the WATERS Collaborative.

Mathematics Education at SSU

The Mathematics Education group at SSU continues to build strong ties with K-12 schools from Sonoma County to the Oregon border. Brigitte Lahme, Ben Ford, Susan Herring, Tracey Jackson, and Nick Dowdall in the Mathematics and Statistics Department, together with Kathy Morris and Megan Taylor in the School of Education, work with counties and districts to design and implement professional development programs, and consult on curriculum issues.

This year will see the beginning of an exciting three-year project with the Santa Rosa City Schools: In *Project Make the Way*, 65 grade K-8 teachers will transform their classrooms by incorporating Maker projects as central elements of mathematics instructional units. Funded by a \$1.8 million grant from the California Department of Education, a multi-disciplinary team of SSU faculty (Ben Ford, Brigitte Lahme, Kathy Morris, Farid Farahmand (Engineering Science), and Jessica Parker (Education)) will lead the professional development program and will design the Maker activities in collaboration with participating teachers.

The *Project Make the Way* partnership between SSU, Santa Rosa City Schools, and the California Mathematics Project: North Coast represents one of the first concerted efforts to build school mathematics understanding out of the self-directed, engaged learning that is such a strength of the Maker movement.

The project will benefit from the experiences of *Learning by Making: STEM Success for Mendocino County*, the SSU-Mendocino County partnership—began last year—which is implementing an innovative curriculum that will bring hands-on science and engineering to Mendocino County high schools.

—Ben Ford

Lectures, Flipped Classes, and Online Learning

The department of Physics and Astronomy has recently offered several of its most popular courses in non-traditional formats, such as the “flipped class” and fully online models. Both of these pedagogical styles have been made possible at SSU through the work of Professor Lynn Cominsky and her SSU/EPO group on campus. This group developed “Big Ideas in Cosmology,” an online resource for teaching introductory and advanced astronomy, with a focus on student interaction with real data and critical thinking.

Using the Big Ideas resource, over the spring and summer of 2014 and now again in 2015, Dr. Thomas Targett offered both “A100: Descriptive Astronomy” and “A350: Cosmology” in a traditional classroom settings, as flipped classes, and as fully online courses.

In a flipped class, students read and engage with material and mathematical exercises designed to teach them the core course learning objectives *before* scheduled class times. With this essential knowledge now in place, lectures no longer serve as content delivery, but instead as interactive discussion sessions focused on connecting the basic factual knowledge to the large conceptual implications.

In the fully online classes, students based around the state were sent material from the Big Ideas resource to be completed each week. As the participants were never in one place together, mentoring, guidance, and assessment were provided via email or message boards.

Early analysis of student performance indicated positive results where comparison with the traditional classroom setting was conducted (see link below). The success of the flipped class model for the A350: Cosmology course has resulted in its continuing use at SSU during the spring 2015 semester, and as an online offering during Summer 2015.

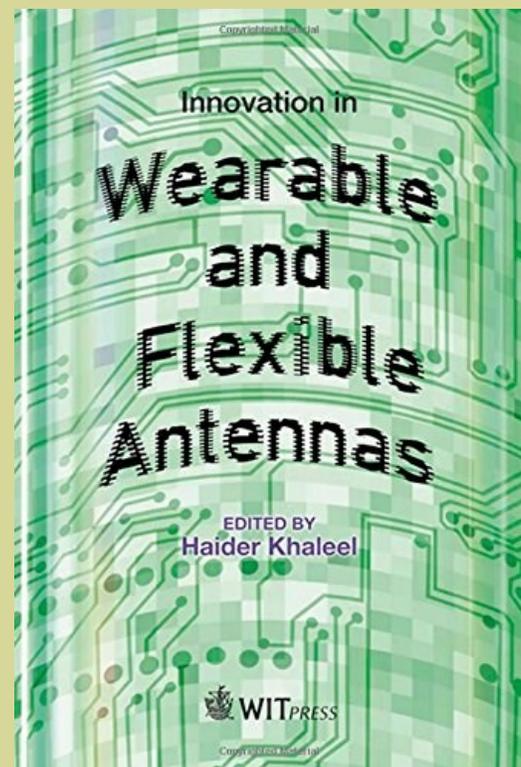
A full description of the Big Ideas in Cosmology material and student performance analysis can be found on their [website](#).

—Tom Targett

Wearable and Flexible Antennas

Dr. Haider Khaleel, Engineering Science, has recently published a book titled *Innovation in Wearable and Flexible Antennas*. The book, published by Wessex Institute of Technology Press (WIT), UK, explores the popularity of flexible and wearable electronics. As Khaleel states in the book’s preface, the widespread popularity of such devices is due to the tremendous advances in materials science and electronics manufacturing and packaging. These electronics, which are light-weight, bendable, rollable, portable, reconfigurable and potentially foldable, could substantially expand the applications of modern electronic devices. It is one of the fastest growing technologies in the world today, with estimated revenue of 45 billion USD in 2016 and over 300 billion USD in 2028.

The aim of the book, the first solely dedicated to this specific technology, “is to provide a comprehensive guide to various technologies and methods applied in the realization of flexible and wearable wireless systems along with state of the art antenna designs and implementations.” The book, a comprehensive reference guide, will benefit a wide range of people—graduate students studying the technology, university professors researching the technology, engineers designing electronics using the technology, and even just general enthusiasts.



Third Consecutive Win by SPS

This past fall, the SSU Society of Physics Students chapter (SPS) was awarded the Marsh W. White award for the third consecutive year. Last year, students used the funds to digitize valuable lecture slides and host a public physics fair; the year before, they visited a local fourth grade class to teach them about magnetism and inspire them to think scientifically.

This year, SPS will use the Marsh W. White award to host a camping trip and observing night at Sugarloaf Ridge State Park and the Robert Ferguson Observatory, a short drive east of the Santa Rosa area. We have been busy inviting students from SSU and local junior colleges and sorting out the logistics of putting on a huge camping trip; as many as 50 students will be joining us for this exciting event.

This trip will be geared primarily toward lower division students who are considering physics or astronomy as a major, but students from all grade levels will be in attendance. It will feature guided observations on the observatory's three telescopes, a presentation on current topics in astronomy, and, of course, plenty of hot dog roasting.

The SPS members are eagerly looking forward to this event, and as of now we anticipate a good turnout and a ton of fun. The trip will take place on Friday, April 17 at Sugarloaf Ridge State Park. Email wesmwatson@gmail.com for more details.

—Wes Watson



New York Times Best Selling author Andy Weir kicked off the 2015 spring semester of the long-running "What Physicists Do" public lecture series. In a break from the normal lecture format, Mr. Weir joined the proceedings via web cam for an interview by series-emcee Dr. Scott Severson of the Department of Physics & Astronomy. Mr. Weir's novel, *The Martian*, is a gripping tale of an astronaut's survival when marooned on the surface of Mars. The book is based on sound science and rational speculation. Mr. Weir's childhood as the son of a particle physicist and his career in software engineering was evident as he deftly discussed technical aspects of his book, from orbital mechanics to ion drive engines. "I did a lot of reading of science fiction books, especially the classics: Heinlein and Clarke and Asimov. So that really shaped what I loved, what I enjoy reading," shared Mr. Weir.

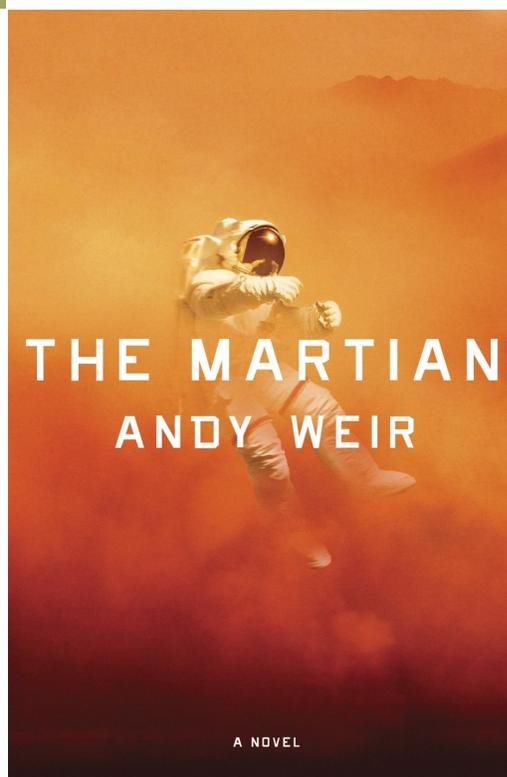
In a lively conversation lasting over an hour, Andy Weir discussed: his career path, the ins and outs of writing, self-publishing, and popular culture.

The Martian is soon to be a major motion picture, directed by the well-renown Ridley Scott, and starring Matt Damon, Jessica Chastain, Sean Bean, Kristen Wiig, and more. "I'm thrilled, I mean this is a dream come true for any writer to have a big-budget movie made out of their book with top-tier actors and one of the world's best directors. It's crazy. It's awesome." As with most all recent "What Physicists Do" lectures, this interview is available via streaming via links at [the series web page](#). —Scott Severson

SPS Summer Internships

Graduating physics majors Aman Gill and Maxfield Torke have won two of the ten (20%!) summer internships offered through the national Society of Physics Students organization. Gill was selected for the American Physical Society Outreach internship, working with Becky Thompson at APS headquarters in College Park, MD. Torke will be working at NASA Goddard Space Flight Center in Greenbelt, Maryland, helping to develop astronomical instrumentation to measure the cosmic microwave background.

Gill was formerly SSU's SPS President, and is now serving as the Zone 18 (California) Associate councilor. Her photo is currently in rotation on the national [SPS home page](#). Torke was also active in SSU's SPS chapter, serving as Vice President last year.



OAKMONT

Community Survey

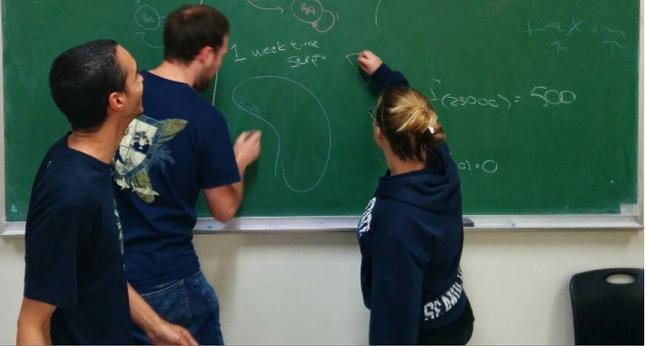


Four stellar nursing students are volunteering to serve the residents of [Oakmont Village](#) (a retirement community for active adults in Santa Rosa) by lending their assistance in a community-wide assessment. Breanna Caton, Jenna Fenton, Sean Rogers, and Kiley Tonsing have been invited by the Oakmont Long Range Planning Committee to help survey their 4500 residents. These senior level students, guided by Dr. Deborah A. Roberts, are involved in the project as part of their Community/Public Health Nursing practicum.

Residents from 55 to 102 years old will be asked to address their community in terms of: community satisfaction; services; recreation; use of resources; personal well-being and health; and desired long range desires for their quality of living in Oakmont. Students will be connecting with Oakmont residents and administering the survey tool in person or over the phone. This project will provide the opportunity for the Department of Nursing to continue to collaborate with community partners in a meaningful way and engage students in community based participatory research.

Following survey completion and data aggregation, the group is planning to submit the survey results at Kaiser Research Conference, Sonoma State University and School of Science and Technology Research Symposium, and the Fourth Annual CHAMP Conference at San Jose State University. —*Deborah A. Roberts*

2015 Mathematical Contest Modeling



Travis Hayes, Ross Jacobs, and Megan Lovejoy (left to right in photo above) represented Sonoma State University in this year's Mathematical Contest in Modeling (MCM). Organized by the Consortium of Mathematics and Its Applications (COMAP), this international contest challenges teams of students to clarify, analyze, and propose solutions to open-ended problems. This year's SSU team used Markov Chains and other mathematical techniques to determine an optimal strategy for eradicating the current strain of the Ebola Virus. Results of the contest will be made available to the public in late April. —*Martha Shott*

The Family Nurse Practitioner (FNP)/ Masters of Science in Nursing (MSN) and FNP Post-MSN Programs received grant funding for the 2015-2016 academic year from the Office of Statewide Health Planning and Development (OSHPD) in January at the public hearing in Anaheim, California. The program received \$185,000.

ANDERSON'S ADVENTURES IN FLORIDA



A close-up of the Orion launch laser.

Steve Anderson, Equipment Technician for Physics and Astronomy, had an eventful December with two separate excursions to Kennedy Space Center in Titusville, Florida.

Anderson participated in the [Orion Exploration Flight Test-1 \(EFT-1\) rocket launch](#) by building a laser projector to make a visual display at Kennedy Space Center Visitor's Center (KSCVC) on December 4, 2014. Anderson's laser

projector served as the beacon for the Orion EFT-1 launch from the Kennedy Space Center the next day. The "beacon" was a 100 watt green ("green for go!") laser sent straight-up, vertically, aimed towards Mars.

It was a whirlwind yet enjoyable twenty-four hours. In between the ceremonial laser projection and Orion launch, Anderson met astronauts, talked with hundreds of guests, and explored KSCVC. Anderson says of KSCVC, it "is a fantastic, interactive museum—too much to describe... [it's] Disneyland for nerds." The Center attracts 10-12 thousand visitors a day, and has a "Rocket Garden" where the USA's missions to space are on display.

The launch the next day went fairly smoothly. It was the first NASA rocket launch in almost a decade after decommissioning the Space Shuttle. NASA's Orion will eventually serve as the vehicle to carry space crews on exploratory deep space missions with destinations such as asteroids and even Mars. Orion's recovery system was the main component test of the launch, with its avionics, altitude control, parachutes and heat shield being evaluated. The Orion EFT-1 rocket orbited the Earth, dispersed Neil



Anderson and the ISS laser.

Armstrong's remains, and safely splashed down roughly 600 miles south of San Diego in the Pacific Ocean.

Anderson returned to Kennedy Space Center (KSC) later in the month to participate in the Holiday's in Space show. Anderson and the group used two pairs of custom made high-power lasers and one 120 watt ISS laser (the largest laser used at NASA) fiber-optically launched into a tele-

scope to track the International Space Station (ISS)—mankind's longest, international, cooperative venture into space. The ISS is only visible for a few minutes and moves very fast. It was cloudy, but Anderson did hit it once. The group sent the beam to the moon as well, and tracked the arc of the ISS in the sky.



Orlando aerial beams and ISS laser.

There were also 2x40 watts of aerial beams in the sky, pointed in the direction of Orlando. Of course, the FAA, FDA, and NASA all have stringent laser safety procedures and clearance with the controllers at the Orlando airport. Patrick Air Force base, situated on Cape Canaveral along with KSC, has restricted air space, so they had exact limits in the sky for their laser show. This was important because it is extremely dangerous to point or track a plane with a laser. Anderson strongly cautions, "Never, ever track an aircraft with a laser pointer; It is a \$10,000 fine and jail." So don't try and recreate the laser show at home! Instead, plan to visit KSC this upcoming holiday season: [Holidays in Space runs from late November until early January.](#)

—Cory Oates





SSU Mobile, an iOS-based app that provides easy access to, among other things, faculty and staff directory information, calendar events, news, and campus maps was updated and made available from the AppStore in February 2015. This is a major revision to the previous version of this app that was published in 2011.

This project was designed and implemented by a group of computer science students over time in Dr. Ali Koo-shesh's mobile app development course. The student who ultimately made this version possible is Eric Amorde. Please download the app from the [AppStore](#) and send any feedback to: SSUMobileApp@gmail.com.