Sonoma State University

SCHOOL OF SCIENCE & TECHNOLOGY

Volume 3, Issue 1 October 16, 2013

A Note from the Dean

Welcome to the Fall 2013 semester in the School of Science & Technology!

Classes are underway and faculty, staff, and students are busy with courses, research, internships, jobs, club activities, tutoring, advising, campus committees and community service – really, you name it! We are doing a record amount of teaching in our School with our campus enrollment at a new high of 9,100 students. And, we have more students pursuing degrees in all of our Science & Technology programs matching the growth in high-tech careers and opportunities we see with our national economic recovery. As an example, there are now nearly 250 students majoring in Computer Science – about the same number as in 2001 at the height of the dot-com boom.

We are committed to supporting and retaining our students and increasing the number of Science & Technology graduates. Examples of our efforts are showcased throughout this newsletter. I am particularly proud of our first SSU Science Symposium featuring the outstanding scholarly activities of our undergraduate and graduate students. The Symposium was held at the end of the Spring 2013 semester in Weill Hall at the Green Music Center. Students were decked out in their business best and their professional-quality poster presentations provided a vibrant and interactive experience for all in attendance. We hope to make this an annual event so watch for announcements of the symposium next year.

At the CSU system level, our new Chancellor, Dr. Tim White, has been touring the campuses to learn about our strengths and needs. He visited SSU on October 9 and met with students, faculty, and many others. He held an open forum with the campus in Weill Hall (watch the video broadcast). He is also working to get the message out about the impacts of the CSU. The *Impact of the California State University* website highlights the economic impact of the CSU including:

- For each $1 invested by the state, the CSU generates $5.43 for California's economy annually.
- When enhanced earnings by graduates are taken into account, the annual return rises to more than $23 for each $1 invested.

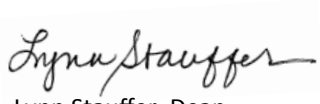
Sonoma State's annual impact on the Bay Area region and the state is remarkable. The site reports:

- Annual spending related to Sonoma State ($213 million) generates a total impact of nearly $330 million on the regional economy and more than $376 million on the statewide Economy.
- This impact sustains more than 2,500 jobs in the region and statewide more than 3,200 jobs.
- Per year, the impact generates $19 million in local and $21.4 million in statewide tax revenue.

Even greater—more than $941.5 million of the earnings by alumni from Sonoma State are attributable to their CSU degrees, which creates an additional $1.6 billion of industry activity throughout the state.

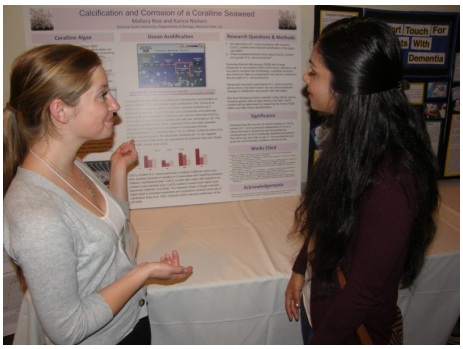
In sharing this newsletter and the many contributions of the members of our incredible School of Science & Technology, I want to thank everyone in our School – and our generous donors and community supporters – for the lasting difference you make in the lives of our students, our community, the North Bay, and our state.

Happy fall to all!



Lynn Stauffer, Dean
School of Science & Technology

SSU SCIENCE SYMPOSIUM CELEBRATES STUDENT SCHOLARSHIP AND RESEARCH



SST students Mallory Rice and Amandeep Gill (L-R).

STEM-FYE* partnered with the School of Science & Technology, WATERS Collaborative, and the SSU Preserves to host the first annual SSU Science Symposium. The Symposium, held during finals week last May, featured talks by STEM-FYE students and a poster session showcasing the scholarship and achievements of more than 110 students in the School of Science and Technology and WATERS Collaborative. More than 250 students, faculty, staff and guests from the community had a chance to mingle and celebrate at the reception with a buffet in the lobby of the Green Music Center. Guests then ventured upstairs to the poster session to learn from the presenting students about their research.

STEM-FYE community partners were also key participants in the symposium. Partners from the Sonoma Ecology Center, Gold Ridge Resource Conservation District, the Sonoma County Water agency, and the Sonoma RCD came to hear the presentations of the science freshmen with whom they had worked during field experiences throughout the spring semester. They also presented their own projects in the poster session.

Steven Farmer, Steven Anderson, and Mark Perri (center, L-R) mingling. SST student Ross Mohs presenting in the plaid shirt and hat, right.

The symposium ended with a keynote talk by scientist and author Ransom Stephens, Ph.D., who inspired the audience to pursue "Greatness in a Technical World".

The SSU Science Symposium was made possible with funding from a Green Music Center Academic Integration Grant, the WATERS Collaborative, and the NASA Education and Public Outreach group. Claudia Luke, Brigitte Lahme, and Jeremy Qualls organized this incredible event. Planning for next year's symposium is already under way.

*STEM-FYE is our NSF-funded innovative freshman learning community that focuses on quantitative skills, biological principles and the process of science, within the overarching topical curricular theme of environmental sustainability.

Student presenters along with Dr. Ransom Stephens, second from the far right and next to Drs. Karina Nielsen and Jeremy Qualls. Drs. Nathan Rank and Brigitte Lahme, bottom left.

NORTH BAY MATH PROJECT: SOLVING A GREAT MATH PROBLEM REGIONALLY

If 300 Northern California math teachers were supported by the North Bay Mathematics Project (NBMP) in summer 2013, how many K-12 students have benefitted from the Project's work over the past 10 years?

NBMP is a collaboration between the SSU Math & Stats Department, the SSU School of Education, and the Sonoma County Office of Education. Since 2000, the NBMP has worked with many districts from Sonoma County to the Oregon border to provide opportunities for over 1000 teachers in K-12 schools to deepen their understanding of mathematics and of approaches to its teaching and learning.

SSU faculty who work closely with NBMP projects include Nick Dowdall, Ben Ford, Tracey Jackson, Brigitte Lahme, and Edie Mendez in the Mathematics and Statistics Department, and Kathy Morris in Literacy, Elementary, and Early Education. September 2013 marks the completion of two large projects: Project LEAD is a 3-year, $3 million project with Santa Rosa, Petaluma, Healdsburg, and Bellevue school districts in which over 100 K-12 teachers became leaders in their districts' adoption of California's new Common Core State Standards in Mathematics. California Common Core powered by Student Success (C^s) is a two-year, $500,000 intensive experience for over 25 teacher leaders from Del Norte, Humboldt, Lake, Mendocino, and Sonoma Counties, learning to be instructional leaders for their colleagues. Each teacher leader learned strategies and mathematics to improve their own classroom practice in accordance with the new standards and presented what they had learned throughout their own county.

Dr. Ben Ford

NBMP conducts many shorter-term professional learning opportunities for other districts and counties. In fact, we estimate that over the past 10 years, more than 40,000 students in Northern California schools have benefitted from the project's work.

For more information about North Bay Math Project, please contact Ben Ford (ben.ford@sonoma.edu).

WATERSHED FIELDTRIP KICKS OFF YEAR

Over 50 freshmen are starting off the year enrolled in our integrated critical thinking, science, and mathematics course *Science 120: A Watershed Year*. On September 7, the new SSU students explored the Russian River watershed. Accompanied by course instructors and regional experts, students visited the Copeland Creek headwaters at the Fairfield Osborn Preserve, Laguna de Santa Rosa, Russian River Mirabel Infiltration Ponds, Russian River Wohler Collectors, Russian River Estuary at Goat Rock and ended with a picnic at Bodega Dunes State Park. The big themes of the trip that threaded their way across presentations at each stop were sedimentation, biodiversity, water use, and fish biology and management. It was an eye-opener for the students and such a critical first-hand experience as they start learning about how science informs management. Presentations by valued community partners – City of Santa Rosa, Sonoma County Water Agency, Stewards of the Coast and Redwoods, and the SSU Preserves – not only provided students with new information, but allowed them to meet the people who are working in the field.

NEW SST FACULTY

Dr. Haider Khaleel

Dr. Khaleel returns to the School of Science and Technology as an Assistant Professor in Engineering Science after spending last year as a visiting professor in the department. He earned his Ph.D. in Systems Engineering from the University of Arkansas at Little Rock and has published extensively.

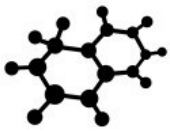
Dr. Monica Lares

Dr. Lares joins our school as an Assistant Professor of Chemistry. She received her Ph.D. in Chemistry and Biochemistry from UC Santa Cruz. Before becoming part of our school, Dr. Lares spent 3 years as a Postdoctoral Fellow in Molecular and Cell Biology at the City of Hope Cancer Hospital in Duarte, CA. She is passionate about student research and is engaged in outreach and community involvement.

Dr. Thomas Targett

Dr. Targett is a visiting professor in the Department of Physics of Astronomy. Dr. Targett earned his Ph.D. in Astrophysics from the University of Edinburgh. He has postdoctoral research experience from the California Institute of Technology and the Universities of Birmingham, British Columbia and Edinburgh. He has a broad interest in galaxy evolution.



CALLING ALL SST WOMEN: SHARE YOUR ENTHUSIASM FOR SCIENCE, TECHNOLOGY, AND MATH!

Next spring, Sonoma State will once again be hosting the Annual Expanding Your Horizons (EYH) Conference. This is the 22nd EYH conference and it will be held on Saturday, April 5, 2014 at SSU. The purpose of the conference is to encourage young women in the 7th and 8th grades to take more math and science classes in high school in order to expand their educational and career choices. The conference draws from area middle schools and a large proportion of attendees are from ethnic minorities, which of course is a priority for University outreach.

During the conference, women who have chosen careers in science and technology share their enthusiasm and expertise in hands-on workshops. The hope is that at a time when teenage girls are most in danger of losing interest in science, technology and math we can inspire them to consider a future career in these fields by providing positive role models and cool hands-on experiences.

Please be on the lookout for the call for workshop leaders in the coming months. To learn more about EYH, talk to the many women in SST who have been workshop leaders in the past. To volunteer for the organizing committee, please contact Brigitte Lahme at lahme@sonoma.edu.

DR. MICHAEL E. SMITH AWARDED $86K IN NSF FUNDING

Professor Michael E. Smith of the Geology department was awarded $86 K in funding over 3 years from the National Science Foundation to pursue a research project "Paleogeographic record of contractional to extensional tectonics in the Cordilleran hinterland, Nevada" that seeks to investigate the surface record of the processes that formed and collapsed a Andes-like orogenic plateau and system of high altitude lakes in the location of present day Nevada. The project will directly involve several undergraduate researchers, and is a collaborative effort involving leading scientists at the University of Wisconsin-Madison and the University of Texas-Austin.

DEPARTMENT OF ENGINEERING SCIENCE AWARDED IRA FUNDING

The Department of Engineering Sciences was awarded IRA (Instructionally Related Activates) funding to expand Environmental Sensors Networks deployed at the SSU Preserves. The project has three goals: (1) to improve and maintain the existing network for greater flexibility and robustness; (2) to teach students across campus basic concepts about how sensor networks function; and (3) to create a new resource for engineering students that allows them to build sensors and other network components. The funding will be used to hire graduate and undergraduate students and provide supplies and equipment needed to support the network. Hired students will become teachers in the Preserves training programs, leading tours and trainings that teach other students about how sensor networks function. "A unique feature of studying engineering at Sonoma is that the students learn by working on real-world projects that improve their community and environment," emphasizes Dr. Farid Farahmand, Associate Professor in the Department of Engineering Science. "The sensor network will not only create a new outdoor laboratory for Engineering Science students, but will act as a showcase for students to present their work to others," says SSU Preserves Director, Dr. Claudia Luke. To learn more about what engineering students do at SSU Preserves see AITIS Laboratory Blog.

MATH WELCOME PICNIC

Sonoma State's Mathematics and Statistics department welcomed new and returning Math and Stats majors during a welcome party on Friday, September 6. Organized by the Mathematics and Statistics Clubs, math students and faculty gathered on the commencement lawn to enjoy a picnic dinner, usher in the new academic year, and meet new freshmen and transfer students.

The Fall 2013 semester has been one of tremendous growth for the Mathematics and Statistics department. Due to a large number of new incoming freshmen and transfer students majoring in math, the department now has nearly 160 math majors. "We are excited to see so many new faces joining our department. Seeing over 50 students and professors at the Welcome Party helped us get together, meet new people, and start building the good sense of community that we strive for in our department," says Michael Cardoso, the Statistics Club President. The entire Math Department looks forward to a great year with many new and familiar faces.

OUT OF AFRICA!

Dr. Farid Farahmand, Associate professor in the Department of Engineering Science, is back from his 7-month trip to Ghana and will resume teaching in the department. While in Ghana, Farid taught a number of undergraduate and graduate courses in the Computer Science Department at the University of Cape Coast. In collaboration with Academics without Boarders Canada, Farid was also involved in coordinating the only PhD program in Computer Science in the country. In addition to his academic responsibilities, Farid was also involved in several educational and community projects aimed at improving education at primary and secondary schools.

Farid describes his experience in Ghana as one of the most rewarding and fulfilling experiences in his personal and professional life. He highly recommends taking advantage of such international opportunities for other faculty and students. "Living in Ghana and visiting other West African countries was an eye opening experience. Perhaps the most educational aspect of it was to learn about different cultures, cultural values, lifestyles, and people. We learned about the richness and long history of these cultures and how we are all linked together. We realized how little we know about the world we live in and how our lifestyles can impact each other," Farid admits. To learn how Farid and his wife, Ivonne, spent their time in Ghana, you can read their blog.

NURSING DEPARTMENT HOSTS CONTINUING EDUCATION WORKSHOP FOR DOZENS OF COMMUNITY PARTNERS

Morning huddle at Santa Rosa Memorial Hospital Care Transitions Program: lead social worker Linda Allen and nursing student coaches Amy Hanningan, RN, and Amy Milbauer, RN, get ready for home-visiting clients after hospital discharge.

On Wednesday, August 28, the Sonoma State University Nursing Department was proud to host a workshop on Care Transitions, a program designed to foster improved coordination of care as patients transfer from one healthcare setting to another. The community continuing education event was spearheaded by Dr. Michelle Kelly, with support from partners Sue Pearce and Mary Bartley from Santa Rosa Memorial Hospital. The continuing education workshop included lectures by guest speakers, sample dialogues between Care Transitions coaches and patients, and an opportunity for participants to practice in role-playing.

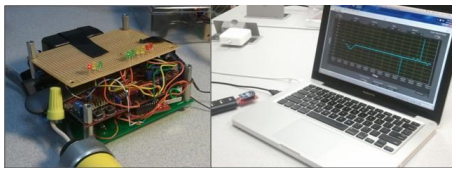
A total of 70 health professionals participated, representing 14 different health agencies: Santa Rosa Memorial Hospital, Petaluma Valley Hospital, Palm Drive Hospital, Queen of the Valley Hospital, Creekside Rehabilitation and Behavioral Health, The Oaks: Alzheimer's and Dementia Care, Golden Living Center Skilled Nursing Facility, Parkview Rehabilitation and Long Term Care, Sonoma County Department of Health and Human Service, Community Action Agency Napa Valley, Santa Rosa Community Clinics, Sonoma and Marin Independent Physician's Association-Meritage Medical Network, Jewish Community Free Clinic, and SSU Nursing Students and Faculty from Community/Public Health and Pediatrics clinical courses.

By hosting this event on campus the Nursing Department was able to meet the demand for professional continuing education for registered nurses and social workers by utilizing expertise provided by faculty. Additionally, the forum served as a student orientation before starting clinicals at Santa Rosa Memorial Hospital and the Community Action Agency, Napa Valley. The shared education event served another purpose: to elevate awareness of health professionals in the community of the caliber and capability of SSU Nursing students in clinical service-learning practicum.

The event also created a forum for networking on the mutual purpose among agency staff of improving self care of their clients after hospitalization. The session provided a bridge to facilitate interaction between nursing students (both pre and post-licensure) and a variety of healthcare professionals, including new and more experienced Care Transition coaches, registered nurses, social workers, and facility administrators. Participants acquired new knowledge on an evidence based care transitions model aimed at supporting clients and caregivers in self care after hospitalization. Those participants unfamiliar with the Care Transitions model were provided the opportunity to develop beginning competencies during a hands-on/role-play practice session during the workshop.

According to evaluations provided by those in attendance, the audience found the provided training to be very valuable and revealed high interest in SSU Nursing hosting future multidisciplinary continuing education events. Future continuing education sessions geared towards providing advanced care transitions training, community health networking, interdisciplinary teamwork, communication, health literacy and informatics are being considered.

ENGINEERING STUDENTS WIN PRIZE IN DIGILENT'S 2012 NATIONAL DESIGN CONTEST

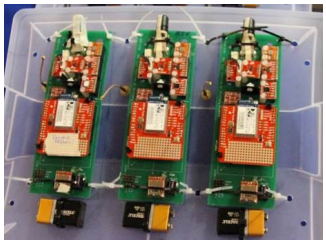


Dustin Farwell and Michael Chastain featured their Senior Design Project in the 2012 Digilent National Design Contest. They demonstrated their working prototype of a Wireless Power Monitoring System (called Wattcher) that can monitor how much power each individual home appliance is using and calculate how much it costs to keep it running. The project was well received by the referees and was characterized as a robust and well-designed project. Presenting at Indianapolis was a great experience for Michael and Dustin. The Department of Engineering Science funded this trip. We wish both of these graduates the best!

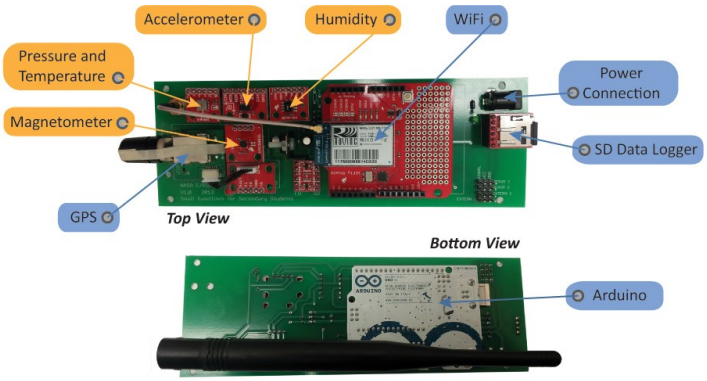
SMALL SATELLITES FOR SECONDARY STUDENTS (S4) - TEACHER TRAINING

Middle-school teacher Beth Hill displays here completed payload.

In partnership with AeroPac and the Endeavour Institute, the Education and Public Outreach group at Sonoma State University has just finished a week-long training at NASA Dryden's Aero Institute. Fourteen middle and high school teachers and four Girl Scout leaders learned how to solder, build, test and program small experimental payloads that can be launched on high-power rockets (HPRs) or flown on tethered weather balloons. This program, "Small Satellites for Secondary Students" or "S4", fills an important "missing link" in NASA's educational pipeline between Team America Rocketry Challenge (TARC) and sounding rocket flights that are usually conducted by graduate students at research universities. The S4 program has created an educator's guide and associated videos, as well as a hardware platform that can easily be used by secondary students to create their own experiments. Training week concluded on July 13 with the launch of the teachers' payloads at the Lucerne dry lake bed, with help from the Rocketry Organization of California. We flew 19 payloads, receiving live WiFi 802.11g telemetry from most of them, with additional data backup on SD cards within the payload.



3 payloads on balloon gondola.



S4 payload configuration.

SSU undergraduate student Kevin Zack and Santa Rosa Junior College student Aaron Pacheco were primarily responsible for the design and manufacture of the S4 board, which has been commercially produced by Advanced Circuits. The figure below shows the board as built by the teachers during the training. The payloads were flown on 3 and 4 inch diameter rockets to altitudes as high as 4500 feet.

During the 2013-2014 academic year, the pilot teachers will help their students build their own experiments. Once completed, the payloads will be flown by partners including: California's AeroPac prefecture of the Tripoli Rocketry Association, the LUNAR chapter of the National Association of Rocketry (NAR) and ROC, as well as through programs such as the Endeavour Institute's Balloon Fest. Students will be able to view many of the flights in real time over the internet through the use of AeroPAC's Virtual Classroom. They will then collect and analyze the resulting data. This program will provide unparalleled access to the design, development, and flight process for hundreds of students involved in the pilot teams, while allowing thousands of additional students to participate online in the flight events and data collection and analysis.

High-school teacher Donald Repucci retrieves rocket after successful flight to 4500 ft. above the Lucerne dry lake bed.

The balloon launch was cancelled due to rain, so high school teacher Sam Koshy took a gondola for a run up the bleachers to acquire data.

More information on S4 can be found on the website.

KINESIOLOGY GRADUATE NAMED BEST HIGH SCHOOL COACH BY *THE PRESS DEMOCRAT*

David Kimari was featured in *The Press Democrat*'s "Best of Sonoma County 2013" publication as the Best High School Sports Coach. David earned his Bachelor of Science in Kinesiology - Exercise Science with Cum Laude honors in the Summer of 2012. David is now in the Kinesiology Masters Program and serves as the Track and Cross Country Coach at Technology High School. Principal Mims of THS says of David "He's dialed in to his athletes. He's a great motivator, he's very competitive, and he inspires and instills that motivation in all our athletes." David says of himself, "I love coaching because I love teaching."

WATER, WATER EVERYWHERE — SSU PRESERVES' BUSIEST YEAR EVER

The SSU Preserves looks for ways to collaborate with faculty to put students in the field and get their feet wet with real-world environmental issues. Last Spring was our busiest ever.

Faculty Collaborations

Many of our collaborations surrounded water. We supported SST faculty with field logistics and community engagement on SST's A Watershed Year for freshmen, the campus wide Water Works initiative, the 2012 SSU Science Symposium, and the Seawolf Day "Walk Through the Watershed" community and donor event.

Kerry Wininger at SST's "Walk Through the Watershed" event.

SSU's WATERS Collaborative, a joint venture between SSU faculty and the Sonoma County Water Agency (SCWA) to engage students in water management issues, was coordinated by the Preserves. During WATERS' first year, faculty from SST (Mike Cohen, Mark Perri, Jeremy Qualls, Tom Buckley, and Mike Smith), Social Sciences, and Arts & Humanities guided 473 students in 14 classes to address local questions about water quality, sediment, evapotranspiration, health, and vegetation management in Copeland Creek. We are looking forward to a second year of support from SCWA to fund faculty to engage their students.

Students and Jobs

The Preserves also seek ways to create novel experiences for students that lead to employment. The Preserves' Grassland Training Program served as a springboard for 10 students to get a foot in door for environmental summer jobs by working with regional organizations on grassland projects. A WATERS Collaborative sediment study landed Chase Takajo (Geography) a job with the Water Agency. And the Preserve employs undergraduates as Preserve stewards and graduate students to teach the Preserves' Naturalist Training Program. Kerry Wininger (Biology) is teaching the Training Program this Fall. The experience is novel in that graduate students, under the guidance of Suzanne DeCoursey, incorporate their ideas for improvement into the teaching materials, strengthening the program.

Preserve Projects in All Disciplines

We continue to work with students and faculty on service-learning and capstone projects across disciplines. We welcome ideas! This year, projects included:

- Osborn Oral History Project with Steve Estes (History).
- Preserve Marketing Plan with Hyuko Lee (Business).
- Osborn Preserve Tour App with Maximilian Maksutovic (Computer Science Capstone). Max hopes to develop the app into a commercial product with his partners.

CHEMWIKI

Dr. Steven Farmer (Chemistry) is working with colleagues from UC Davis, Diablo Valley College, Contra Costa Community College, Hope College, and the University of Minnesota, Morris, on the creation of ChemWiki. Funded by NSF and led by Dr. Delmar Larsen of UC Davis, the collaborative project aims to not only provide students a supplemental or alternative to their textbooks, but the ability to develop content for an integrated online resource.

Dr. Farmer is currently writing textbook material for the second semester of organic chemistry. Along with the three other writers on the team, they hope to have the equivalent of a general and organic chemistry textbook online at the conclusion of the two-year grant. He is hoping to start using the ChemWiki in his courses starting this year. With additional funding, the group hopes to have online textbooks for all types of chemistry courses.

The ChemWiki is part of a larger STEMWiki, which is in the process of putting up online biology, physics, and math textbooks.

ENGINEERING DEPARTMENT AWARDED GRANT BY CSU CHANCELLOR'S OFFICE

Professors Jack Ou and Farid Farahmand received a Campus as a Living Lab grant from the CSU Chancellor's Office for their project, titled "Understanding Campus Watershed Ecosystem through Creating an Interdisciplinary Capstone Project," designed to utilize campus as a living laboratory. The $11,900 grant will help to address campus's water sustainability, and increase awareness and understanding of the campus community about how we interact with the surrounding natural environment, particularly in terms of our water footprint. The project will also include a collaboration with the Santa Rosa Junior College, Department of Biology, and the Center for Community Engagement.

KINESIOLOGY STUDENT RECOGNIZED WITH CSU TRUSTEES' AWARD

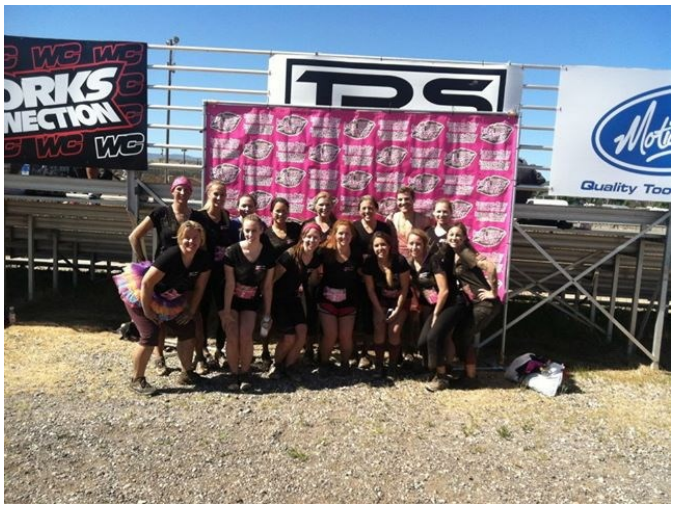
John Michael Vincent Coralde was named as 1 of 23 recipients of the California State University Trustees' Award for Outstanding Achievement. John Michael Vincent is a senior majoring in Kinesiology - Exercise Science with a minor in Biology. As related on SSU's home page "As a native Filipino, Coralde felt the struggles of poverty and hunger very deeply and saw education as the path out of his family's destitution." At age 14 he moved to the U.S., where now at SSU,"He has served as a guide in programs ranging from Summer Orientation and Summer Bridge to peer advising and community service advisor."

SSU NURSING CLUB UPDATE

The Nursing Club at Sonoma State has been continuing to walk the talk, as the parlance goes, by being actively engaged in a number of health initiatives both on campus and in the greater community. During Fall 2012, the club provided the public with features of health education at the SST Science Festival and Geek Week. They also participated in Expanding Your Horizons at the Santa Rosa Junior College where they jumped at the opportunity to teach grade school children about various aspects of health education. On Seawolf Decision Day, they helped incoming freshmen examine the various majors and make decisions about those they might like to pursue.

To raise awareness and money for cervical cancer research, the club took part in the 5K Kiss Me Dirty run. Last spring, they held a bake sale to raise funds for research investigation pediatric rheumatic diseases. Plans for this year include participating in Making Strides against Breast Cancer, an event that includes a 5-mile walk to raise money and awareness for breast cancer research.

One of the most valuable initiatives, and one that has been sustained for several years, is the club's mentor-mentee program. Mentors help incoming nursing students with questions and concerns and provide support when the going gets tough. With the new streamlined curriculum, new nursing students are paired with seasoned nursing students who guide them through the initial, challenging year. That the program is self-sustaining is great evidence of its value to participants, both old and new. This year the mentor-mentee relationships were established during a summer picnic held to meet and greet the incoming junior class.



Kiss Me Dirty 5k.

Bake sale for pediatric rheumatic diseases.

ELEMENTARY CHARGING: A LESSON ON ELECTRICITY AND MAGNETISM FOR 4TH GRADERS

By Jack Horowitz and Travis Pappa

In California, it is often easy for elementary school teachers to forget the importance of science under the pressures of statewide-standardized examinations, such as STAR testing, which stress mathematics and reading skills. The Society of Physics Students (SPS) chapter members of Sonoma State University (SSU) have become aware of the plight of science in the local schools and believe it is important for elementary students to be exposed to the sciences. SPS members have therefore developed and presented a small lesson plan for a local fourth grade class which involves an interactive, experiential presentation of electricity and magnetism.

To help carry out all of these tasks, SPS commissioned a small committee consisting of Physics students Jack Horowitz, Travis Pappa, and Amandeep Gill to create a proposal for the SPS national Marsh White Grants – an award given out to SPS chapters with some of the best ideas to take physics to the public education. The SSU chapter of SPS won the award and used it to teach physics to students at Roseland Elementary School to help inspire a new generation of scientists with their lesson plan.

SPS members as they interact with 4th grade students from Roseland Elementary.

The physics lesson that SPS presented to the fourth grade class of Roseland Elementary School demonstrated electricity and magnetism and how they interact with each other in the real world. The lesson involved assisting the students in building simple electric motors, showing new and interesting demos of electricity and magnetism, and providing more materials (such as more magnets) for the students to take home with them to further their understanding at home. In addition to the simple electric motor and displays already made, SPS created a superconducting levitation demonstration. This consisted of a superconductor (Y-$Ba_2Cu_3O_7$), liquid nitrogen, and small neodymium magnets. It was made in the hopes of showing the fourth grade students a fun and weird side of magnetism.

Students excitedly raise their hands to answer Travis's questions about magnetism.

The outreach was considered a success as evidenced by how engaged the students were with the lesson. By providing students with a science experience that is not easily forgotten, SPS demonstrated how engaging science can be for students by allowing them to participate in active, hands-on learning. Furthermore, the chapter designed a format for future elementary school outreaches that the chapter can utilize and improve upon. It is the members' hope that by doing this, the chapter has made it easier for future outreach teams to engage the community with hands-on science lessons, particularly for electricity and magnetism.

2013 SUMMER HIGH SCHOOL INTERNSHIP PROGRAM

Over the summer, eleven of Sonoma County's top high school science students took part in the School of Science and Technology's sixth annual Summer High School Internship Program (SHIP). These students undertook research projects alongside SST faculty mentors from the departments of Biology, Computer Science, Engineering Science, Kinesiology, Mathematics & Statistics, and Physics & Astronomy, as well as the NASA Education and Public Outreach group. On September 18, the students presented their research results at a symposium held at SSU.

EC3—EARTH-CENTERED COMMUNICATION FOR CYBERINFRASTRUCTURE: CHALLENGES OF FIELD DATA COLLECTION, MANAGEMENT, AND INTEGRATION

Dr. Matty Mookerjee, Geology, has been awarded NSF funds totaling $299,329 for EC3—Earth-Centered Communication for Cyberinfrastructure. This project helps to facilitate the over-arching goals of the EarthCube project. EarthCube seeks to transform how research is conducted through the development of community-guided cyberinfrastructure and to integrate information and data across the geosciences. The vision of EarthCube is to revolutionize Earth Science investigations by promoting better data access, incorporating cyberinfrastructure into scientific workflow, and allowing increasing sophistication of analyses and modeling. A significant strength of EarthCube is its potential for breaking down the artificial barriers between subfields within the Earth Sciences, allowing us to ask new types of questions, and providing the means to contend with previously unanswerable questions.

Specifically, this grant funds the organization of two field excursions to facilitate a dialogue between field-based geologist, computer scientists, and cognitive scientists concerning the types of unique problems faced by the geological community with respect to data format, standards, management, representation, and integration. Members from the different geological sub-communities will greatly benefit from the opportunity to discuss the types of data that they collect in "the field" (i.e., outside in the natural environment) with a group of cyber-infrastructure (CI) and software development professionals/researcher. We hope that by having these meetings in the field, the computer scientists will gain a better appreciation for the types of data that we collect, common methods for collecting those data, the field tools/technology that we employ, our data recording conventions, and the types of question we try to address with our data. There is no better place to gain this appreciation than in the field. For the same reasons that we bring students into the field to explain fundamental concepts in geology, the field will provide an excellent venue for engaging with computer and cognitive scientists about the multiple scales and interconnections of geological data, data collection techniques, and data representation; it is the most efficient place to gain an understanding about these topics. Sharing experiences in the field, both intellectual and practical, is a time-tested method for creating a strong and collaborative scientific community. We anticipate that the computer scientists will be able to guide our conversations with information about computational limitations/consideration as well as informing us about existing database technologies.

This NSF funded grant supports the assembly of a Research Coordination Network (RCN) that fosters the collaborations between Earth Scientists and Computer Scientists and Cognitive Psychologists. The Steering Committee for this project draws on the expertise from researchers from the following institutions: Cornell University, College of Charleston, University of Utah, Rocky Mountain Biological Laboratory, University of Southern California, Franklin and Marshall College, Pennsylvania State University, University of Texas, El Paso, University of Wisconsin, Madison, University of Kansas, Temple University, Rensselaer Polytechnic Institute, University of Massachusetts, Amherst.

IET SPONSORED PATW HELD AT SSU

Dr. Haider Khaleel, Engineering Science, organized a Present Around the World (PATW) competition which was held April 19, 2013 at SSU. The Institution of Engineering and Technology (IET) sponsors the PATW competition worldwide to encourage and recognize young and talented engineering students and professionals. The competition also aims to develop and improve students' and young professionals' presentation skills while providing an environment in which they can network, learn about the latest advancements in engineering and technology, and gain access to new ideas.

The competition was judged by Drs. Haider Khaleel, Meng-Chih Su, and Salam Marougi. Two SSU Engineering Science majors won the competition. Scott Parmley (picture at right with Dr. Khaleel) won first place with his presentation entitled "Raspberry Pi Garden," and will go on to Toronto to participate in the regional finals. The trip is fully funded by IET. Parmley also received a cash prize of $250. Michael Chastain (picture at left with Dr. Khaleel) won second place for his presentation, "The Wattcher," and received a cash prize of $150. Both were awarded a year's membership in IET.

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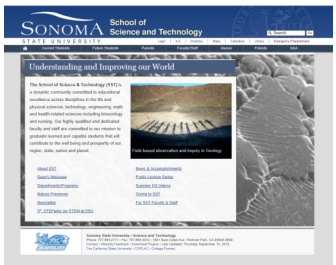

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DR. RIVOIRE RECEIVES FUNDING TO STUDY LARGE-SCALE POWER CONSUMPTION

Dr. Suzanne Rivoire of the Computer Science department has received two external awards in 2013, totaling $103,832, to study the power consumption of large-scale computing facilities. The two awards, from Oak Ridge National Laboratory and the Computing Research Association, have funded five SSU undergraduate researchers to study the power consumption patterns of typical applications that run in supercomputers and data centers.

OAKLAND ZOO BIODIVERSITY CENTER

The five-plus year partnership between the Biology Department's Dr. Nick Geist, San Francisco State University, and the Oakland Zoo on the North Bay Western Pond Turtle Project culminated this August with the opening of the Oakland Zoo's Biodiversity Center. The three partnered to research, raise, and release western pond turtles back into the wild. The three entities studied and researched the western pond turtles' nesting patterns, breeding, habitat threats, incubation, growth, and diets. As Dr. Geist says, the collaboration on the North Bay Western pond Turtle Project "is a model for the key role that zoos can play in both basic science and applied conservation of imperiled local species. Working closely together we have been able to establish a highly effective program that has the potential to save these amazing animals."

Their work embodies the ultimate goal of the Biodiversity Center: to educate the public on "the crucial interdependence of plants, animals, people, and the environment." The Center will provide displays on current and ongoing research that focuses on the study, management, protection, and restoration of threatened and endangered species.