



THE SCIENTIST

2016

Science in Our World and Beyond

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Exploration and Discovery Thrives at the College of Science!

DR. KIM BLISNIUK’S RESEARCH GROUP

The Geology of Earthquakes



Field work studying paleo-earthquakes in Nevada with Kit Bella-Pratt, Kirby Kiefer, Kim Blisniuk, Alex Shmurakov, and Jeff Lee.

Dr. Kimberly Blisniuk’s research group at SJSU combines the interdisciplinary fields of tectonic geomorphology and Quaternary geochronology to better understand how earthquakes and climate change modify the landscape. As a field geologist and geochronologist, she is interested in landscape evolution, earthquake geology, and tectonic reconstructions of dynamic processes in the upper crust. A particular interest is how crustal deformation at depth and changes in Earth’s climate are archived on

Earth’s surface, as this information is critical for understanding regional climate and tectonics. Her research group implements a variety of field and laboratory tools aimed at characterizing and quantifying rates of active landscapes. These tools include geochronology (specifically terrestrial cosmogenic radionuclides and U-series dating), structural and geomorphic mapping, the analysis of high-resolution topography data, GIS, and the application of mechanical models to simulate the behavior of the structures observed in the field.

As an earthquake geologist, Dr. Blisniuk examines and dates the movement of landforms and surface deposits adjacent to active faults, like the San Andreas Fault, to estimate the rate and behavior of the fault. This means she is gathering rocks, soil and sediment (material) along California’s most prominent earthquake generating fault. She then measures that material’s age and measures the movement of the fault in the field and then estimates how fast the fault is moving. Data from the measurements that Dr. Blisniuk and her students obtain in the field goes into scientific models of earthquake recurrence and seismic hazards. The data is also used by the federal government and insurance assessors to figure out where homes are the most vulnerable - or least vulnerable - to earthquake damage in order to determine earthquake insurance rates.



(Facing) Kirby Kiefer and Alex Shmurakov listening to Sandy Keely at the Anza Borrego Desert Paleontology Society on the topic of a local Mammoth discovery. Dr. Blisniuk is processing the dating of the mammoth.

—Dr. Kim Blisniuk
Assistant Professor

COLLEGE OF SCIENCE *DEAN'S MESSAGE*

UPDATE ON THE INTERDISCIPLINARY SCIENCE BUILDING PLANNING PROCESS



J. Michael Parrish, Dean

For the last academic year, a group of CoS Staff (myself, Associate Dean for Research **Marc d'Alarcao**, and Director of Facilities **Stan Vaughn**) have been working with a team of faculty (**Annalise Van Wyngarden** from Chemistry, **Cleber Ouverney** from Biology), Chairs (**Karen Singmaster** from Chemistry, **Jeff Honda** from Biology, and **Michael Kaufman** from Physics and Astronomy), and students (**Krista Wirth** from Biology and **Anthony Balistreri** from Chemistry) on the very detailed process of planning for the Interdisciplinary Science Building (ISB), which will be the first new academic building to go up on campus since MLK library in 2003. We have enjoyed a great partnership with Administration and Finance on this process, under the leadership of Interim VP **Josee Larochelle** and new VP **Charlie Faas**, although Planning Design and Construction Senior Director **Ashraf Fouad** and Associate Director **Daniel No** have been the most intimately involved in the process.

They have retained two design firms, **WRNS Studio** and **Research Facilities Design (RFD)** to spearhead the planning process, not only for the new building, but for the master plan for the entire College of Science, which hopefully will be housed entirely within Duncan and the new building within a decade or less.

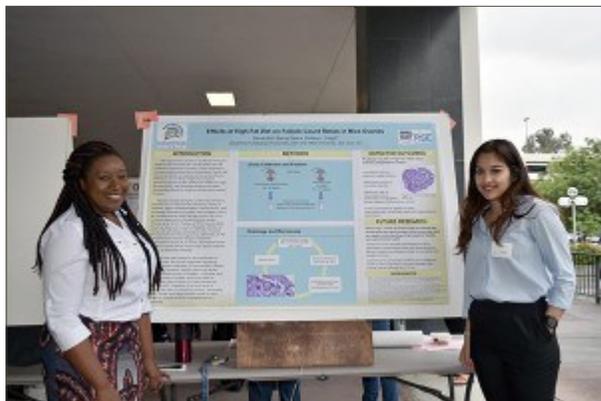
The core function of the new building will be improved wet lab teaching and research facilities for Chemistry, Molecular Biology, and Microbiology, along with a new interdisciplinary facility focused on high performance computing. However, we broadly consulted with other departments and other colleges, and are in the process of seeking funding for a number of additional facilities, including such innovative ideas as a Maker Space (Innovation Design Center), a visualization theatre, and a physical home for the Silicon Valley Center for Big Data and Cybersecurity. The plan is to make the new building, which will be located in the SW quadrant of campus adjacent to Duncan, an inviting space with many opportunities for students and members of the community to study, do collaborative research, and to learn from Science on Display exhibits throughout the building. More importantly, the building will be critical in establishing better facilities for active learning and student and faculty collaborative research, a pattern we intend to continue with the renovation of Duncan Hall.

With the Planning Process now complete, our next step is to return to the Capital Planning Office at the CSU Chancellor's Office to secure approval for the building planning documents, which will open the door for starting the two year, room-by-room design process for the building, leading to groundbreaking in 2018 and occupancy by 2021. The College of Science has needed a new science building for many years, and plans for such a building surfaced as far back as the 1980s. However, thanks to unified efforts by Presidents Papazian, Martin, and Qayoumi, Provost Feinstein, and Administration and Finance leadership, we are closer than ever to that exciting goal.

— J. Michael Parrish, PhD
Dean, College of Science

12TH ANNUAL STUDENT RESEARCH DAY

MORE THAN 60 STUDENTS GAVE PRESENTATIONS ON MAY 6, 2016



Biological Sciences majors Bianca Opara (left) and Dania Abid share their findings.

On May 6 at the 12th Annual College of Science Student Research Day more than 60 undergraduate and graduate students presented work from a variety of disciplines.

Bianca Opara, '18 Biological Sciences and **Dania Abid**, '17 Biological Sciences, both worked in Professor **Shelley Cargill's** hands-on physiology lab. Abid wants to pursue a medical degree while Opara is interested in combining research and medicine. At the recent event, they presented the process they are using to discover the effects of a high-fat diet on follicle count ratios in mice.

Opara, who is part of the Research Initiative for Scientific Enhancement (RISE) Program, said she was first approached by program director **Karen Singmaster** when she was a sophomore.

While Opara was at first hesitant to join the program due to timing, she decided to take Singmaster's advice to apply when she heard from other students involved in RISE. "I am so excited they let me in," she said. "It helped me figure out that I like hands-on procedures."

Carlos Rojas, '16 Geology, with a minor in Business, used connections near his hometown of Hollister to gain access to private property for geochemistry research on the Quien Sabe Volcanics of west central California. His faculty advisor **Ellen Metzger** and other student researchers had completed an analysis of areas north and south of the area studied. Rojas, a Marine Corp veteran, said he loved rocks since he was a kid and was interested in learning how the landscape was created. "It was really exciting, exploring the area and finding new results," he said. "It is a beautiful area."

Organic Chemistry Professor **Roy Okuda** has organized the Student Research Day each year since its inception. He said it originally started because he realized many students were attending off-site meetings to present their posters but the work wasn't being shared on campus. Its location in the breezeway of Duncan Hall allows lower division students to mingle with upper division and graduate students between classes.

Students from Biological Sciences, Chemistry, Computer Science, Geology, Mathematics and Statistics, Meteorology and Climate Science, and Physics and Astronomy on topics ranging from the impact of drought on invasive plant species to using music to analyze protein sequences to surveying the densest galaxies.

The College of Science event is one of many on campus that highlights the benefits to both students and faculty members of working together on research, scholarship and creative activity, a high-impact practice that is highlighted in SJSU's Four Pillars of Student Success student engagement pillar.

— Blogs.sjsu.edu/academicaffairs
May 19, 2016

Note: The annual Student Research Day event is free and open to everyone to view the amazing achievements of our College of Science students.

BIOLOGICAL SCIENCES *IN THE NEWS*

SJSU ENTOMOLOGY GOES TO THE SANTA CLARA COUNTY FAIR



The Department of Biological Sciences entomology group set up an insect display booth at the Santa Clara County fair during its four day August run, and generated public interest in all things creepy crawly. Kids and adults alike roamed the various displays and learned about mimicry, aquatic insects, and taxonomy. Live arthropods including Madagascar hissing roaches, scorpions, and a number of tarantula species were made available for handling, and microscopes were on hand educate people on finer details of arthropod structure. **Jeff Honda** and museum volunteer **Duane Stephens** answered questions on disease vectors, garden pests, and biology programs at SJSU.

The exhibit was awarded the fair's Full S.T.E.A.M. Ahead Manager's Choice award for best exhibit. Special thanks to Duane who organized the exhibit and spent four full days at the fair!

— Dr. Jeff Honda
Chair, Biological Sciences



CHEMISTRY IN THE NEWS

***Aedes aegypti* Mosquitos and the Zika Virus**



Pictured top left: James Nguyen, (MS student), Daniel Fong (Undergrad student), Dr. Alberto A. Rascón Jr. (PI), Diane Eilerts (MS student, Jacob Hickey (MS student). Bottom: Kamille Parungao (Volunteer Research Student), Olive Burata (MS Student), Rachael Lucers (MS Student), Alexia Perryman (Undergrad Student), Kathy Nguyen (Undergrad Student) and Regina Elmore (MS Student).

The female *Aedes aegypti* mosquito loves to feed on humans and, like many mosquitoes, is a great nuisance. However, unlike many of the thousand mosquito species in nature, the female *Aedes aegypti* mosquito is a carrier of the Yellow fever, Dengue fever, Chikungunya and Zika viruses. These viruses can be spread from the mosquito to human hosts leading to fever, muscle and joint pain, headaches, vomiting, which are a few of the common symptoms shared by each of these viral infections. Individually, each virus can lead to more serious conditions such as hemorrhaging, severe joint and arthritis pain, and jaundice. Unlike the other viruses, Zika is the first mosquito borne virus that can be sexually transmitted from the male to its partner. Zika virus infection does not necessarily lead to symptoms in healthy individuals, but the virus has been linked to cranial and brain abnormalities in babies, a condition known as microcephaly. This virus has made news recently, especially since the Olympic games were held in Brazil, which is the breeding ground of the

Ae. aegypti mosquito already infected with the virus and where thousands of Zika virus infections have been reported. Unfortunately, at the moment, no treatments or vaccines are available to combat the Dengue fever, Chikungunya, and Zika viruses. The only method available is vector (mosquito) control using pesticides.

Since pesticides are the only method to control the mosquito population and pathogen transmission, our research lab is focusing on a different aspect of mosquito control. An important characteristic needed for the transmission of these viruses is blood meal acquisition from its human host. The female *Ae. aegypti* mosquito must feed on human blood in order to obtain the necessary nutrients for the egg laying process. When a blood meal is acquired, the midgut of the mosquito releases digestive enzymes (proteases) in a biphasic manner, with low trypsin-like activity observed in the first 15 hrs post blood meal, followed by a larger increase in activity in the later phase (30 hrs post blood meal). These enzymes are important for releasing amino acids and peptides that are then used for the egg production process. We hope to target these proteases and determine if an inhibitor can be developed to target all proteases, thereby inhibiting blood meal digestion, which in turn should inhibit egg production. This should lead to a decrease in the mosquito population and decrease in pathogen transmission. To help us with this endeavor, our research lab was awarded a four-year (\$300,000) NIH NIGMS SCORE (SC3) grant to study the mosquito midgut extracts, as well as the most abundant midgut proteases. We are collaborating with researchers at the University of California, San Diego (UCSD), University of California, San Francisco (UCSF), and the University of Arizona. We hope to expand our protease studies with viral experiments and determine if these mosquito midgut proteases play an immune response role or if they are involved in viral activation, helping the virus infect the mosquito.

— Dr. Alberto A. Rascón Jr.
Assistant Professor

COMPUTER SCIENCE *IN THE NEWS!*

STUDENT HELPS DEVELOP NEW 3D TECHNOLOGY



Daniel Geisler, '17 Computer Science.
(Photo: Neal Waters, '07 Geography, '16
MS Mass Communications)

When holographic reality tech company [LEIA Inc.](#) invited 16 computer science students to participate in an automotive hackathon last December, the startup looked forward to the results.

The students did not disappoint, delivering projects utilizing the company's 3D technology in various capacities including car displays, speedometers, navigation and automation.

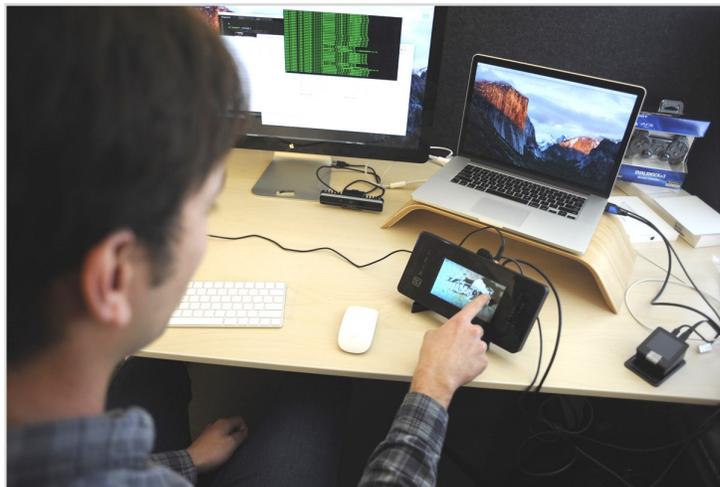
But the hackathon was extra meaningful for one Spartan: **Daniel Geisler, '17** Computer Science, is now a member of the company's software development team.

"We saw that Daniel was very quick at figuring stuff out and working with the other students and teams, and he had a good technical background," said LEIA Inc. Project Lead **Loren Beyerstein**. "We originally were hoping to hire several interns and it turned out that we decided that it was best to start out with one, and we're hoping that we can bring in more in the future."

Although Geisler has only been working with the company for a little over a month, **Armand Niederberger**, director of data science and algorithms at LEIA Inc., said his contributions are immeasurable.

"He helped build the LEIA Core Library when he first started," Niederberger said. "In the beginning especially and still now, [he's] very crucial to helping us get our code clean and to the next level, and to making sure it works with the latest software out there."

Part of Geisler's role entails translating the company's code so it can be utilized on any platform on any computing environment, which can be a tedious task. Geisler spends eight hours a day fishing through code and ensuring that



LEIA Inc.'s animation demos run smoothly.

More recently, Geisler has utilized his prior video-game development experience in fine-tuning LEIA Inc.'s mesh animation, which is technology that is intended to mirror a human's facial expression and duplicate it on a 3D-simulated character, or avatar.

"I literally just sit there tweaking some code and looking at it to see if it's working right [by making facial expressions]," Geisler said.

— Lauren Hernandez
Academics & Research News
March 24, 2016

COMPUTER SCIENCE *IN THE NEWS!*

INTERNET OF THINGS WORKSHOP — HACKATHON

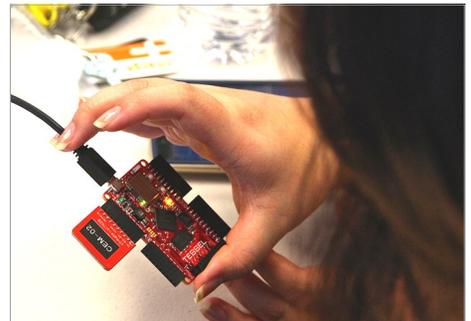


Meredith Ku, VMware intern, and **Robinson Raju**, MS Computer Science '16, review the accounts they've just set up on Aeris' cloud management system Photo: Lauren Hernandez, '15 Journalism)

The workshop, born from collaboration between the SJSU Department of Computer Science and Aeris, a Santa Clara-based cellular network operator, offers students not only an introduction to various scripting languages but also the opportunity to create their own applications.

Thirty San Jose State undergraduate and graduate computer science majors spent a recent Saturday hunched over hardware chips and sensors as part of a two-week Internet of Things Workshop that kicked off on March 19, 2016.

“One of the original goals of this was a basic hackathon but at a much higher level, so most of the work is going to be with JavaScript,



Meredith Ku, VMware intern, takes a closer look at a blinking Tessel Board as it connects to her laptop (Photo: Lauren Hernandez, '15 Journalism).

Python, the Tessel platform and the types of sensors that feed data into the Internet of Things,” said **Harry Plant**, vice president of social sector at Aeris. “More importantly, I would like [students] to take away a sense of working at a Silicon Valley company.”

Groups were armed with a box of components to kick-start their product development stage, which included AeroCloud credentials to access the company’s Cloud system, a Tessel board hardware platform, connecting cable, climate or RFID (radio-frequency identification) modules, and Python and JavaScript software for coding.

Maanasa Madiraju, Aeris senior software engineer, guided participants in connecting Tessel boards to their laptops and navigating the company’s data management system. “Our basic objective is to help students learn new languages so they can use them for the mainstream jobs,” Madiraju said.

Over the next two weeks, participants had the opportunity to visit Aeris offices to attend “office hour” sessions, where they can debugged their ideas and gained feedback from Aeris engineers on how to improve their applications.

Students presented their final applications to Aeris on April 2, in a judging process that takes into consideration originality of the idea, technical achievement and execution, and real world value or commercial viability.

“There are two end goals,” Plant said. In addition to completing an app, the firm wants to “bring more students into Silicon Valley workplace and to expose them to the Internet of Things, and have them think from a design perspective,”

— Lauren Hernandez
Academics & Research News
March 24, 2016

MATHEMATICS AND STATISTICS *IN THE NEWS!*

UNDERGRADUATE STATISTICS TEAM RECOGNIZED IN NATIONAL COMPETITION

A team of undergraduate students working with Mathematics and Statistics professor **Martina Bremer** was honored in the Undergraduate Statistics Project Competition sponsored by the American Statistical Association and the Consortium for Advancement of Undergraduate Statistics Education. The team - **Weimeng Pu, Amy Dum Ayobami Fasanya** and **Will Simons** authored a paper entitled Examining Worldwide Income Inequality that received third place in the Undergraduate Statistics Class Project Competition. Congratulations to Martina and her prize-winning students!

— J. Michael Parrish, PhD
Dean, College of Science

METEOROLOGY AND CLIMATE SCIENCE *IN THE NEWS!*

GREEN NINJA PROJECT RECEIVES \$1.1 MILLION FROM NSF—2015



An interdisciplinary research team from San José State has been awarded \$1.1 million from the National Science Foundation to design and implement the ‘Green Ninja Film Academy (GENIE),’ an intervention that leverages well-established research on motivation to encourage student interest and engagement in the STEM-related field of climate change.

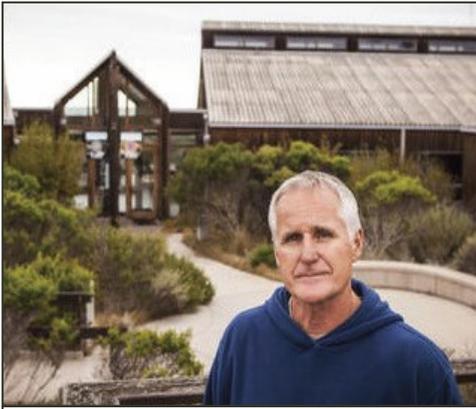
The project is aimed at scientifically-underserved middle school students who will be guided through a structured storytelling and filmmaking experience that builds competencies in science, engineering design, media technology and communications. During the three-year project, 60 teachers and at least 2,000 students will directly participate in the GENIE project, with additional participation from parents, friends, and teachers who attend the Green Ninja Film Festival. GENIE is also designed around helping teachers prepare to implement the Common Core and Next Generation Science Standards (NGSS) using climate change as a context.

The project builds on the established Green Ninja Project, and an SJSU initiative that develops media to inspire student interest in science and the environment. The principal investigators of the NSF grant are SJSU professors **Eugene Cordero** (Meteorology and Climate Science), **David Chai** (Animation/Illustration), **Ellen Metzger** (Geology and Science Education), **Grinell Smith** (Elementary Education) and **Elizabeth Walsh** (Meteorology and Climate Science and Science Education). More information about the project can be found at www.greeninja.org.

—Academic Spotlight
blogs.sjsu.edu/academicaaffairs/chemistry
November 9, 2015

MOSS LANDING MARINE LABS *IN THE NEWS!*

MLML CELEBRATES 50 YEARS!



Jim Harvey, MLML Director

Moss Landing Marine Laboratories (MLML) is celebrating fifty years of education and research. In that time, MLML has graduated more than 600 Master's students and generated \$500 million in contracts and grants. Research has been conducted throughout the world. In the past three years alone, MLML has been in Antarctica, the Arctic, the Indian Ocean, Mexico, Chile, Indonesia, the Caribbean, across the Atlantic, and of course up and down the eastern Pacific Ocean. We are everywhere.

MLML Alumni have gone on to be successful professors, state and federal government employees, teachers, environmentalists, and more. Some did not leave MLML and have developed thriving research labs here.

MLML has grown from a relatively small institution to a fairly large conglomerate of buildings, acreage, faculty, and students (more than 250 people in total). We have gained an international reputation for ocean science, in large part because of the work of former director John Martin, but all MLML researchers have made significant impacts in their disciplines.

I am always inspired, in awe, and grateful for the incredible effort by students and staff to produce the annual Open House. I do not know of any other marine lab that so thoroughly and thoughtfully opens their doors to the public, and we have been doing this for fifty years. The "Spirit of MLML," which embodies community, hard work, success, excellence, and environmental stewardship, lives on. Much of this spirit is being captured in weekly blogs commemorating MLML's 50th anniversary, check them out: <https://anniversary.mlml.calstate.edu>. Happy 50th everyone.

—Jim Harvey
Director

Moss Landing Marine Laboratories

The Open House was celebrated over the April 30 through May 1, 2016 weekend.



MLML Open House hosted more than 2,200 visitors.

PHYSICS AND ASTRONOMY IN THE NEWS!

DR. KHATAMI AND HIS TEAM USE HIGH-PERFORMANCE COMPUTING TO EXPLORE EXOTIC PHASES OF MATTER

Dr. Ehsan Khatami's research is on theoretical modeling and numerical simulation of strongly –correlated materials. These are solids in which the repulsive interaction between electrons plays a crucial role in determining their low-temperature properties, often giving rise to exotic phases of matter such as superfluidity or superconductivity. The latter is characterized by the complete loss of resistance to electric current. These materials are already being used in medical devices (magnetic resonant imaging), and in transportation (magnetic levitation for high-speed trains), and hold the greatest promise for future energy, and technology applications.

In recent years, Dr. Khatami has been collaborating with experimental atomic, molecular and optics scientists at Rice University and the MIT-Harvard Center for Ultracold Atoms to simulate electronic systems in optical lattices as a way to understand their collective behavior in the crystalline structure of atoms in real materials. Their results for the first observation of magnetic ordering in three dimensions was published in Nature last year and new findings for the charge and magnetic ordering in a two dimensions recently appeared in Science. Here is another article in the Academic Spotlight.

Mike Mulanix ('16 Physics), an undergraduate student in Dr. Khatami's group, has studied competing phases of electrons on a depleted square lattice and presented his results at the American Physical Society's 2016 March Meeting in Baltimore, MD (see picture). He is a co-author in an upcoming paper on this topic with Dr. Khatami. **Demetrius Almada** and **Kelvin Ch'ng** are graduate students in the group who are developing machine learning techniques to categorize model problems that can be solved by the D-wave quantum computer in terms of hardness.



Demetrius Almada and Kelvin Ch'ng

Supported by the College and the Department of Physics and Astronomy, last year Dr. Khatami, with help from Mike, put together a small computer cluster, consisting of four nodes (54 cores), using parts acquired from different vendors. The cluster has been used for research in his group at almost full capacity ever since. He was part of the team, led by Dr. **Sen Chiao** (Meteorology), who received a Major Research Instrumentation grant from the National Science Foundation for the acquisition of a \$900K high-performance computing cluster for research at San José State University.

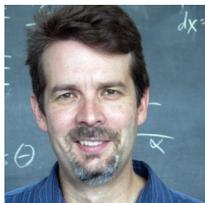


Mike Mulanix with Dr. Khatami at APS meeting in Baltimore, MD .

— Dr. Ehsan Khatami
Assistant Professor

PHYSICS AND ASTRONOMY *IN THE NEWS!*

FACULTY ACCOMPLISHMENTS



Aaron Romanowsky became only the third faculty member in the history of the CSU to be named a Cottrell Scholar by the Research Corporation, an award that is presented to “**the very best early career teacher-scholars in chemistry, physics and astronomy...**” Other winners hail from Cornell, Duke, Georgia Tech, USC, Carnegie Mellon, to name a few. His project: *The Nature and Nurture of Galaxies: Dynamics, Dark Matter, and Data Mining* will involve development of courses at the undergrad and grad level that incorporate statistics, database manipulation and modeling, visualization, data mining, etc. “Through a combination of experimental and theoretical triumphs, we have arrived at an overarching framework—a ‘standard cosmological paradigm’ - for explaining the expansion of the Universe and the evolution of stars and galaxies, and ultimately the creation of planets and life,” stated Romanowsky.

We continue to work on curricular reform, with Physics 50 efforts led by **Monika Kress** and Physics 2A being led by **Cassandra Paul** and 2015 hire **Benedikt Harrer**. Benedikt piloted a learning assistant program last semester, where undergrads who have taken the course and done well become peer mentors assisting the TAs in the discussion labs. **Ranko Heindl** and **Monika Kress** have joined the university’s First-In-The-World course transformation efforts – funded by a \$3M Department of Education grant – designed to strengthen STEM classes and improve retention and graduation. Part of their summer efforts involved transforming the Physics 50 and Physics 51 laboratory curriculum.

Although he tells me he’s no longer an official member of the LIGO collaboration, some credit for the recent detection of gravitational waves must go to **Peter Beyersdorf**. He and his students have made significant contributions to the project over the years, so I think that SJSU Physics and Astronomy department can claim a piece of the credit for this major discovery. Peter and Aaron did a masterful job of explaining the science and its implications at a public talk. The video can be found on the department web site, www.physics.sjsu.edu.

Ramen Bahuguna led a group of students to the Optics and Photonics winter school at University of Arizona where they learned about recent advances in biosensing, optical engineering, astronomical optics, etc., and were encouraged to pursue advanced degrees and careers in optics-related fields. One student described it as “the best experience of my life.”

With his Cambridge colleague Huw Price, **Ken Wharton** continues to publish radical interpretations of quantum mechanics, which some day I hope to understand. One of their recent papers on entanglement includes the section title “What About Bob” which is an achievement for a scientific paper in itself.

Carel Boekema had a leave last fall where he worked with colleagues in Switzerland and at SETI. He continues to work with large numbers of students, bringing them to conferences to present their work. This spring, he was recognized for 30 years of service at SJSU.

With over 30 years in the physics department, Professor and past-Chair **Kiumars Parvin** officially retired this May.

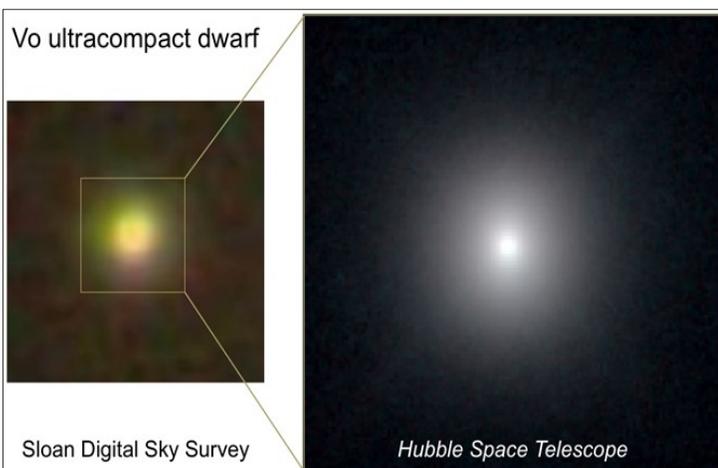
Ehsan Khatami is co-director of a \$1M NSF major research instrumentation proposal that will fund an on-campus state-of-the-art HPC facility for use by faculty and students across the STEM disciplines at SJSU. The machine will have 1700 compute cores and a peta-byte of high performance storage (see page 10 for more on HPC).

— Dr. Michael Kaufman
Chair, Physics and Astronomy

STUDENTS AND ALUMNI IN THE NEWS!

STUDENTS STUDY THE DENSEST AND THE FLUFFIEST GALAXIES

In the last newsletter, we reported the amazing discoveries of two undergraduates, **Richard Vo** and **Michael Sandoval**, of the record-breaking densest galaxies. Mentored by Assistant Professor **Aaron Romanowsky**, their work has now been published in *The Astrophysical Journal Letters*, and both students have gone on to graduate school in astrophysics. Their article can be found [here](#).



New imaging of ultracompact dwarf galaxy discovered by Richard Vo.

Sandoval uses the national supercomputer center in Oak Ridge, Tennessee, to model the explosions of stars (supernovae).

Vo's discovery has been followed up with the world's most powerful ground- and space-based observatories to search for a supermassive black hole (results to be announced soon!).

Vo and Sandoval have also passed the baton to a new cohort of budding astrophysicists at SJSU. Undergraduates **Bradley Thompson** and **Christopher Dixon** recently discovered fascinating new examples of compact galaxies caught in the act of formation, and masters student **Maria Stone** is studying the opposite extreme: the ultra-

diffuse or "fluffiest" galaxies, a brand new class of object discovered just last year that are incredibly rich in dark matter. Stay tuned for further news, coming soon to a galaxy near you.

— Aaron Romanowsky
Associate Professor
Physics and Astronomy

RISE AND MARC STUDENTS AWARDED AT 2015 BIOMEDICAL CONFERENCE

SJSU students and faculty attended the Annual Biomedical Research Conference for Minority Students in Seattle, WA during November 11-14, 2015, where five SJSU students received awards. **Fauna Yarza** received an award for her microbiology poster presentation. "It gave me confidence in myself as a scientific communicator", said Yarza, '17 Biological Sciences/Microbiology. Yarza is part of the Research Initiative for Scientific Enhancement (RISE) program that promotes research opportunities for underrepresented minorities. Working with Assistant Professor **Elizabeth Skovran**, Yarza and other students are researching bacteria that appear to be able to take in rare earth elements that could be beneficial in recycling metals from electronics.

MARC-USTAR (Maximizing Access to Research Careers Undergraduate Student Training in Academic Research) and LSAMP (Louis Stokes Alliances for Minority Participation), and the CoSRaTs (College of Science Research and Teaching Scholars) program students attended this conference. **Dr. Karen Singmaster** is the coordinator of LSAMP and director of CoSRaTs. **Dr. Leslee Parr** is director of MARC-USTAR.

MARC students **Jessica Ballin** and **Rebecca Sandoval** presented research. In addition, RISE students **Elvia Silva** and **Adrian Riives** were recognized with an award.

— Blogs.sjsu.edu/academicaffairs
November 9, 2015

GRANTS AWARDED

PROF. AARON ROMANOWSKY RECEIVED COTTRELL SCHOLAR AWARD

Professor **Aaron Romanowsky** of the Physics and Astronomy department is one of 24 scientists recognized as a 2016 Cottrell Scholar by the Research Corporation of America. Each recipient receives \$100K to support their research and teaching. Aaron was the only professor from the CSU to receive one of these awards, and it is significant recognition of the great work he has been doing here at SJSU.

—Dean Michael Parrish
February 24, 2016

PROF RESA KELLY RECEIVES NSF GRANT

Dr. **Resa Kelly** of the Department of Chemistry and the Science Education program shared the great news of her National Science Foundation proposal being funded titled “Collaborative Research: Developing a Visualization Framework for Chemical Reactions” was funded at \$265K. Resa’s work is at the cutting edge of the field of visualization of chemical reactions. The research to design effective strategies to develop and present molecular visualizations that support student learning in General Chemistry. The framework will present students with a video of experimental evidence followed by animations in variance to each other. The student will critique the animations and reflect on the accuracy of each. The goal is to enhance student success across a wide range of scientific disciplines.

— Dept of Chemistry News
October 1, 2015

DEPT OF EDUCATION FIRST IN THE WORLD GRANT FUNDED

SJSU was one of 17 successful applicants (out of over 300 submissions) for the Department of Education First in the World Grant Competition. The campus was awarded \$3M for a collaborative project with Cal Poly Pomona and CSULA to further integrate active learning into classes in mathematics, physics, computer science, and engineering.

Provost **Andy Feinstein** was the PI, and most of the faculty participants come from the College of Science: **Chris Tseng** (Computer Science); **Marion Campisi**, **Tim Hsu**, and **Julie Sliva** (Mathematics and Statistics); and **Monika Kress** and **Ranko Heindl** (Physics and Astronomy). Congratulations to all of these CoS participants!

—Dean Michael Parrish
September 22, 2015

FACULTY AWARDS AND RECOGNITION

STEPHANIE TREWHITT: 2016 OUTSTANDING LECTURER AWARD



Stephanie Trehitt in the Biological Sciences greenhouse. (Photo: David Schmitz)

The Outstanding Lecturer Award recognizes a lecturer for excellence in teaching effectiveness and service to the SJSU campus community.

Stephanie Trehitt, Biological Sciences was honored at the 17th Annual Faculty Service Recognition and Awards Luncheon on March 15, 2016.

Trehitt began her career as a field researcher. After a faculty mentor invited

her to teach a course in her program at SJSU, she says, “I found a passion to teach.” After 14 years as a lecturer, Trehitt says the most meaningful part of her job is teaching undergraduate students to be thoughtful researchers. Through field research, students work with local agencies that need help, such as the federal and state fish and wildlife departments, the local water district or park systems.

“I work to connect students with potential future employers,” she says. “These agencies are underfunded and our students are providing valuable data that the agencies can use for future management.”

Trehitt and her students have worked in Huddart County Park in San Mateo, Canada de los Osos Ecological Preserve in south Santa Clara County and at Pinnacles National Park in San Benito County, primarily on projects that collect data on small mammals and plant communities.

“I have lots of colleagues who love to go to Guatemala and other exotic places, but I love California because there is so much to do,” Trehitt says. “This is such a neat and interesting place with questions to answer.”

—WSQ Blog
Spring 2016

FACULTY AND STAFF

RETIRED FACULTY

Retired Faculty —

Dr. Roger Alperin, Mathematics & Statistics

Dr. Herbert Silber, Chemistry (end FERP)

Dr. Kiumars Parvin, Physics and Astronomy (end FERP)

Dr. Brian Peterson, Mathematics & Statistics

Dr. Jeffrey Smith, Computer Science

Joan Parker, Moss Landing Marine Labs

We wish each of you a fabulous retirement!

FACULTY — NEWLY HIRED AND PROMOTED

Newly Hired Tenure-Track Faculty as Assistant Professor —

See the next two pages (16 and 17) for our 15 new faculty!

Promoted Faculty —

Dr. Rachael French, to Associate Professor, Biology

Dr. Cleber Ouverney, to Professor, Biology

Dr. Resa Kelly, to Professor, Chemistry

Dr. Scott Hamilton, to Associate Professor, MLML

Dr. Aaron Romanowsky, to Associate Professor, Physics & Astronomy

STAFF — NEWLY HIRED AND PROMOTED

Hired Staff —

Brian Ackerman, Marine Operations Mgr., Moss Landing ML

Josue Alcaraz, Academic Advisor, CoS Advising Center

Susan Arias, Director, MESA

Terra Eggink, Graduate Program Coord, Moss Landing ML

Randall Radcliff, Academic Advisor, CoS Advising Center

Lars Rosengreen, Botany Technician, Biology

Promoted Staff —

Diane Davis, Director of the Science Education
Resource Center (SERC)

Wishing all of you a happy future — Congratulations!

MEET OUR NEW FACULTY!

FALL 2016: 15 NEW FACULTY JOINING THE COLLEGE OF SCIENCE

Bree Grillo-Hill (Biological Sciences) is a cell biologist, who came to SJSU from the University of California San Francisco, where she was a postdoctoral fellow. She has previous teaching experience at SF State, the University of Santa Clara, Washington University, and Occidental College and has received grants and awards from AAAS and NIH. Her research involves the study of cell differentiation and cell shape determination in early development.

Chet Simocko (Chemistry) is an organic chemist who comes to us from the Center for Integrated Nanotechnologies at Sandia National Laboratories. Dr. Simocko got his doctorate at the University of Florida and his undergraduate degree at Rensselaer Polytechnic Institute. He has broad experience in polymer chemistry.

Maya Ackerman (Computer Science). Dr. Ackerman was most recently an Assistant Professor at the University of Florida and previously had postdoc appointments at UCSD and Cal Tech. She received her doctorate, master's and bachelor's degrees at the University of Waterloo. Dr. Ackerman's research focuses on artificial intelligence and machine learning. She has received funding from the Office of Naval Research, NSERC, the University of Florida, and U. of Waterloo.

Phil Heller (Computer Science). Dr. Heller is moving over from a postdoc position at Moss Landing Marine Labs to an Assistant Professor position in CS. He received his PhD from UC Santa Cruz, his Master's in Bioinformatics from SJSU, and his undergraduate degree in Electrical Engineering from UC Berkeley. His recent research has involved bioinformatics and data science approaches to the study of marine invertebrates. Dr. Heller has extensive industry experience, including positions at NEXT and Sun Microsystems, where he taught JAVA, a subject on which he has published four books.

Jenny Lam (Computer Science) received her Doctorate in Computer Science and Masters in both Computer Science and Math from the University of California Irvine and her undergraduate degree from UCLA. She has expertise in security and cache optimization for cloud-based computing architecture.

Ryan Portner (Geology). Sedimentologist Ryan Portner comes to SJSU from a postdoctoral position at Brown University. He received his doctorate from Macquarie University, his Master's from the University of Montana, and his undergraduate degree from the University of Pittsburgh. He worked as a Postdoc (2011-2013) and Research Technician (2013-2014) at the Monterey Bay Aquarium Research Institute. His grants include awards from NSF, the Australia Institute of Geoscientists, the Petroleum Exploration of Australia, and the American Chemical Society. His most recent research involves the sedimentology and volcanic history of mid-ocean spreading ridges.

Daniel Brinkman (Mathematics and Statistics) joins the COS from Arizona State University, where he was a visiting Assistant Professor. He received his Doctorate at the University of Cambridge and a dual Bachelor's (in Physics and Mathematics) from the University of Minnesota. He has received funding from the Department of Energy and ASU. Dr. Brinkman's research interests include reaction-convection-diffusion systems, mathematical modeling of thin film solar cells, and simulation and applications of partial differential equations.

Wes Maciejewski (Mathematics and Statistics). Dr. Maciejewski most recently was a lecturer at the University of Auckland, and he held previous positions at the University of British Columbia and Queen's University. He received his Doctorate from Queen's University, his Master's from the University of Calgary, and his undergraduate degree from the University of Alberta. His research interests include learning and teaching mathematics, evolutionary graph theory and game theory.

More.....

MEET OUR NEW FACULTY!

FALL 2016: 15 NEW FACULTY JOINING THE COLLEGE OF SCIENCE

Cristina Tortora (Mathematics and Statistics). Dr. Tortora comes to us from MacMaster University, where she was a Postdoctoral Fellow. She was previously a post doc at both the University of Guelph and Stazione Zoologica Anton Dohrn. She received her Doctorate, Master's and undergraduate degrees from Università degli Studi di Napoli Federico II and additional Master's degrees from Université Lumière Lyon 2. Her research interests include clustering, classification, computational statistics, discriminant analysis, and biostatistics.

Yan Zhang (Mathematics and Statistics) was most recently a Visiting Assistant Professor at UC Berkeley. He received his Doctorate from MIT and his Bachelor's from Harvard University. His primary research interests are in various combinatorial problems including areas such as coding theory, fair division, topology, and physics. He has received a Distinguished undergraduate teaching award at Berkeley, and previously received an NSF Graduate Fellowship and led the Harvard Team for the 2006 ACM Programming Competition.

Neil Lareau (Meteorology and Climate Science) was most recently a postdoc at Lawrence Livermore and SJSU. Dr. Lareau, who received his Doctorate and Master's degrees from the University of Utah, specializes in synoptic climatology, specifically the mechanisms of cold air pooling and cloud formation.

Katie Lage (Moss Landing Marine Laboratories) was hired as the Librarian for the MLML-MBARI Research Library at Moss Landing Marine Laboratories. Most recently, she was Associate Professor and Head of the Jerry Crail Johnson Earth Sciences and Map Library at the University of Colorado. She received her undergraduate degree from CSU Santa Cruz and her MLS from San José State University.

Thomas Madura (Physics and Astronomy) comes to us from NASA's Goddard Space Flight Center where he was an NSF Postdoctoral Fellow. Dr. Madura, whose specialty is computational astrophysics, was also previously a Postdoctoral Fellow at the Max Planck Institute, and received both his undergraduate degrees and his doctorate from the University of Delaware. Prior to his NASA postdoc, he was an NSF GK-12 Fellow at the University of Delaware.

Betsy Mills (Physics and Astronomy) was hired to augment the department's Astronomy program. She comes to SJSU from The Department of Astronomy and Steward Observatory at the University of Arizona, where she was a Jansky Fellow. Dr. Mills earned her Doctorate at UCLA, and her Bachelor's from the University of Indiana. She has previously held appointments at the National Radio Astronomy Observatory, the Max Planck Institute for Astronomy, and the European Southern Observatory. Her grants and awards include a Jansky Postdoctoral Fellowship, an NSF GK-12 Fellowship, and two awards from the National Radio Astronomy Observatory.

Neil Switz (Physics and Astronomy) was most recently an Assistant Professor at Evergreen State College. He previously held research positions at UC Berkeley, Cornell University, and Stanford University. His industry experience includes Fluidigm Corporation, where he was one of the founders, Andros Corporation, and Teknekron Corporation. He holds eight (8) patents and has applications pending for four more. At SJSU, he will augment the research and teaching programs in optics.

These are the 15 new faculty joining the College of Science this year. This is the largest group of faculty hired since I arrived at SJSU in 2006, and we are thrilled to have such a diverse and accomplished group of scientists and mathematicians augmenting our faculty. ***Congratulations to all and welcome to the College of Science!***

— Dr. Michael Parrish
Dean, College of Science

One Washington Square
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EXPLORING FOR A BETTER TOMORROW!

As an alumnus of the College of Science, you are part of a community who are continually seeking answers about our world and beyond.

For those interested in a better tomorrow, please consider making a donation toward our continued excellence in teaching future scientists and cutting edge research.

THE SCIENTIST

COLLEGE OF SCIENCE

J. Michael Parrish, PhD, Dean

Elaine Collins, PhD, Associate Dean

Marc d'Alarcao, PhD, Associate
Dean for Research

EDITOR

Cher Jones, Academic and College
Analyst

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The College of Science would like the reader's feedback regarding this newsletter. Suggestions and comments can be directed to Cher Jones at cher.jones@sjsu.edu. Thank you for your support of our amazing college!

