GREETINGS: We are pleased to present the annual publication of highlights from our UC Statewide Symposium. By participating in this event, the premier systemwide CAMP activity, students test their understanding and move forward in subject mastery. The symposium affords students the occasion to share their scholarly work and grow in confidence in their own abilities to communicate effectively with faculty and peers. For first time presenters, the event is a gateway to other venues of scientific discourse. Student scholarly work is reflected in the abstracts appearing in this publication, and demonstrates a level of achievement that is a model for the nation. We also present exciting profiles of students on UC partner campuses. We extend thanks and appreciation to all the faculty who dedicated time to judge the posters and provide feedback to presenters. Working together we are advancing STEM retention and degree completion as well as success in graduate school.

Marjorie DeMartino, M.F.A.,
Symposium Chair,
California LSAMP Co-Director
Derek Dunn-Rankin, Ph.D.,
Professor and Chair, Mechanical &
Aerospace Engineering,
California LSAMP Co-Director
Senior Alliance Best Practices
Propelling STEM Success Forward

- Summer Bridge programs for entering freshmen
- Orientation and smooth transition for Community College transfers
- Welcoming campus environment and shared sense of purpose
- Development of written and oral communication skills
- Persistence in STEM majors through academic, social and professional activities
- Support for engaging in laboratory research
- Opportunities for summer internships and research
- Professional development through leadership in campus activities, workshops and panels, and in student chapters of science and engineering organizations
- Faculty mentoring / social and professional settings
- Peer counseling / Peer tutorials and study sessions
- Preparation of a scientific poster or oral presentation based on lab research and co-authorship of paper or abstract
- Graduate school preparation, GRE, personal statement, interview skills
- UC Systemwide undergraduate and graduate networking
- Statewide research symposium, encouraging first-time presenters and faculty feedback
- Documentation of program through publications and newsletters
- Statewide networking for all participants
- Student tracking through the B.S. degree and graduate school

UC Systemwide Historical Summary: 1990-91 – 2012-13

The CAMP program serves to support UC diversity goals and broaden participation in STEM.
Students dressed and conducted themselves professionally during their poster presentations.

Networking and making new friends was an integrated activity during the weekend events.

Above, Happy Awardees! the competition for awards was keen.

CAMP Statewide Host team.

A UCI campus tour gave attendees a glimpse into student life at Irvine.
2013 Symposium Presenters and Awardees

PRESENTERS

**Biological/Life Sciences**
Teddy Agyapong, UC Merced
Olivia Anumudu, UC Irvine
Alan Avalos, UC Los Angeles
Aisha Babb, UC Irvine
Grober Baltazar, UC San Diego
Ian Bravo, UC Merced
Elena Caceres, UC San Diego
Katelyn Carmichael, UC San Diego
Francisco Carranza, UC Riverside
Mario Cortes Garcia, UC Merced
Julia Devito, UC Riverside
Oscar Fernandez, UC Santa Cruz
Richard Flores, UC Los Angeles
Joseph Fowler, UC Los Angeles
Christopher Galley, UC Riverside
Mary Graves, UC San Diego
Matthew Guevara, UC San Diego
Abraham Gutierrez, UC Santa Cruz
Steve Guzman, UC Los Angeles
Walter Hardesty, UC Los Angeles
Jessica Hernandez, UC Berkeley
Elvira Hernandez Lopez, UC San Diego
Noel Isaad, UC Santa Cruz
Marty Martinez, UC Davis
Bissrat Melakeberhan, UC Riverside
Ryan Mendoza, UC Davis
Jackelyn Moya, UC Davis
Viridiana Murillo, UC Merced
Rafael Ordaz, UC Davis
Reynal Palafox-Rosas, UC Santa Barbara
Brian Perez, UC Los Angeles
Yukie Perez, UC Riverside
Michael Rale, UC Los Angeles
Salvador Ramirez, UC Riverside
Bryan Ramirez-Corona, UC Davis
Kenny Robles, UC Los Angeles
Xochitl Rojas-Rocha, UC Santa Cruz
Nebay Russom, UC Davis
Rachel Scarlett, UC Santa Barbara
Rahwa Sebhatu, UC Davis

UC Santa Cruz

UC Berkeley
The quality of the posters and the understanding shown by the presenters continues to increase; it is a testament to the commitment of the students, their advisors and mentors, and the CAMP coordinators to the highest quality STEM experience.

–Dr. Derek Dunn-Rankin, Professor and Chair, Department of Mechanical and Aerospace Engineering, CAMP Statewide Co-Director, UC Irvine
BIOLICAL SCIENCES SPECIAL MERIT Awardees

Bryan Ramirez-Corona, UC Davis
Brian Perez, UC Los Angeles
Kenny Robles, UC Los Angeles
Mario Cortes Garcia, UC Merced
Salvador Ramirez, UC Riverside
Oscar Fernandez, UC Santa Cruz

PHYSICAL SCIENCES/ENGINEERING SPECIAL MERIT Awardees

Maryrose Barrios, UC Berkeley
Destiny Garcia, UC Davis
Daniel Jaimes, UC Irvine
Brett Lopez, UC Los Angeles
Erika Galvez, UC Riverside
Alan Gomez, UC San Diego

BIOLICAL SCIENCES Honorable Mentions

Jessica Hernandez, UC Berkeley
Marty Martinez, UC Davis
Olivia Anumudu, UC Irvine
Brenda Gonzalez-Garcia, UC Irvine
Sarah Valles, UC Irvine
Steve Guzman, UC Los Angeles
Walter Hardey, UC Los Angeles
Viridiana Murillo, UC Merced
Christopher Galley, UC Riverside
Grober Baltazar, UC San Diego
Elena Caceres, UC San Diego
Mary Graves, UC San Diego
Rachel Scarlett, UC Santa Barbara
Abraham Gutierrez, UC Santa Cruz

PHYSICAL SCIENCES/ENGINEERING Honorable Mentions

Steven Chavez, UC Berkeley
Melvin Lorenzo, UC Davis
Arturo Arroyo, UC Irvine
Marisa N. Lopez, UC Irvine
Azucena Robles, UC Merced
Francisco Contreras, UC San Diego
Marina Fernandez, UC San Diego
Jorge Padilla, UC Santa Barbara
CAMP is dedicated to UC undergraduate achievement in STEM. Faculty mentored research experience is the cornerstone, providing the preparation and impetus for graduate studies. UC faculty assert that creative research is one of the best ways to prepare students for persistence toward the B.S. degree and success in graduate school.
**GENETIC DIVERSITY AND POPULATION STRUCTURE OF ROOT APHID DAKTULOSPHAIRA VITIFOLIAE IN CALIFORNIA**

Brian Ramirez-Corona, Genetics, 5th year Senior, University of California, Davis
Andrew Walker, Ph.D.; Summaira Riaz, Rong Hu, mentors, Department of Viticulture and Enology

Daktulosphaira vitifoliae, the grape phylloxera, is an agricultural pest native to North America. This insect feeds on roots of Vitis vinifera wine and table grape varieties, causing large swollen galls (tuberosities) on mature roots, which crack open and provide entry for soil-borne pathogens. However, many North American Vitis species are resistant to phylloxera and have been used as rootstocks. This insect is difficult to exterminate from an area, so understanding its biology is crucial in controlling existing populations and preventing the collapse of resistant materials. This study focuses on phylloxera population dynamics in the UC Davis department vineyards, which harbor plant materials from many different genetic backgrounds. The existing insect population coupled with the amount of host diversity raised concerns that vineyards may be a source of artificial selection driving phylloxera populations to adapt to resistant plant materials. Twenty-one blocks were sampled for phylloxera on the roots of self-rooted and grafted vines. A total of 369 insects were collected from 76 different samples and DNA was extracted from 156 insects. Thirty-two microsatellite markers including 28 recently published and 4 previously established markers were used for genotyping. One hundred forty-six samples yielded good amplifications. Population structure and genetic diversity analysis was carried out using various statistics programs to determine number.

**EPIDERMAL INDUCTION MEDIATED THROUGH MULTIVESICULAR ENDOSES**

Brian Perez, MCDB, Senior, University of California, Los Angeles
Edward De Robertis, M.D., Ph.D., Biological Chemistry; Diego Ploper, graduate student mentor

The Wnt and Bone Morphogenic Protein (BMP) pathways have been shown to direct the differentiation of ectodermal tissues towards epidermal fates. Wnt signaling requires multivesicular endosomes, also called multivesicular bodies (MVBs) in order to sequester Glycogen Synthase Kinase 3 (GSK3) from the cytosol, inhibiting its activity. GSK3 phosphorylates both beta-Catenin and Smad1/5/8, the effectors of the Wnt and BMP pathways, respectively. We propose that these two pathways that drive...
epidermal induction are linked through a common mechanism: the sequestration of GSK3 into MVBs. Thus, knocking down MVB formation should inhibit epidermal induction. In order to test the hypothesis, hepatocyte growth factor regulated tyrosine related substrate (HRS), a core component necessary for MVB formation, was knocked down in Xenopus laevis embryos in which epidermal differentiation was induced either through Wnt8 DNA microinjections or BMP4 protein treatment in dissociated animal cap ectodermal cells. Analysis of gene expression levels by Real Time-quantitative Polymerase Chain Reaction (RT-qPCR) showed that knock-down of HRS inhibits Wnt induced epidermal induction to a greater extent than BMP-induced induction. Preliminary results indicate that an antisense morpholino directed against HRS inhibits epidermal induction. If preliminary experiments are confirmed, these experiments show for the first time that MVB formation is required for epidermal induction.

**FGF SIGNALING REDUCES WNT EXPRESSION AND IMPAIRS INNERVATION OF THE SUBMANDIBULAR GLAND**

Kenny Robles, Senior, Molecular, Cell and Developmental Biology, University of California Los Angeles

Wendy Knosp, Ph.D, Matthew Hoffman, B.D.S., Ph.D., Matrix and Morphogenesis Unit, LCDB/NIDCR/NIH/DHHS, Bethesda, MD

Salivary gland (SG) hypofunction decreases saliva production, leading to the impaired oral health of patients. Identification of the key processes in SG development is critical for future regeneration of damaged glands. Fibroblast growth factors (FGF) signaling is required for submandibular gland (SMG) development as the gland does not form in Fgf10 knockout mice. FGF signaling interacts with Wnt signaling during duct development in the developing SMG. We hypothesize that FGF signaling controls Wnt expression in the SMG duct to promote parasympathetic ganglia (PSG) innervation. Ex vivo culture of E12 SMGs for 18 hours or 24 hours with exogenous FGF7, FGF10 or FGF7+FGF10 were performed and analyzed to determine the changes on gland morphology and gene expression. It was confirmed through immunostaining techniques that exogenous FGF treatment had a negative affect on PSG morphology. qPCR analyses indicated that Wnt expression levels were decreased within 24 hours of FGF treatment. Based on these studies, we found that FGF7 alone can affect Wnt expression and the development of the SMG, while FGF10 alone does not. However, further testing is currently being conducted in order to identify the exact mechanism and the key factors involved in the process. The results of these studies will help inform future efforts to regenerate damaged salivary glands.

“I am constantly surprised by the level of biological science research being performed by these UC undergraduates in the Louis Stokes CAMP program. In addition, the level of professionalism among these students is most noteworthy. My PhD students could learn a lot from these students.”

–Dr. Judy Kjelstrom, Director, Biotechnology Program, UC Davis
**SYMBIODINIUM CHANGES UNDER CORAL DISEASE EVENTS IN MONTASTREA FAVEOLATA**

Mario Cortes Garcia, Biological Sciences, Senior, University of California, Merced

Mónica Medina, Ph.D., School of Natural Sciences; Collin J. Closek, graduate student mentor

Caribbean coral reefs have experienced an increase in the number of diseases and disease outbreaks within the last 10 years. One disease, Yellow Band Disease (YBD), also known as Yellow Blotch Disease, is widespread throughout the Caribbean and affects several coral species including *Montastraea spp.*, which are dominant reef building species in this region. While it is known that corals live in symbiosis with *dinoflagellate endosymbionts* (*Symbiodinium spp.*), little is known of the interactions between *Symbiodinium* and diseased corals. *Montastraea faveolata* colonies found in the Caribbean Sea are associated with multiple clades of *Symbiodinium*. In this study we collected samples from both healthy and diseased colonies. We extracted DNA and amplified the *Symbiodinium* 18S ribosomal DNA gene. We analyzed phylotype polymorphism by restriction fragment length polymorphisms (RFLP) to compare *Symbiodinium* clade signatures across samples. We observed changes in *Symbiodinium* clade diversity when comparing healthy vs YBD inflicted *M. faveolata* colonies.

**ABSCISIC ACID SIGNAL TRANSDUCTION ANALYSIS THROUGH AGROBACTERIUM BIOTRANSFORMATION**

Salvador Ramirez II, 5th year Senior, Environmental Sciences, University of California, Riverside

Sean Cutler, Ph.D., Assaf Mosquina, Ph.D., Department of Botany and Plant Sciences

The purpose of our research is to better understand the receptors involved in the abscisic acid (ABA) signal transduction pathway in *Arabidopsis thaliana*. What is known about ABA and its pathway is that it modulates different developmental processes and responses to environmental stress in higher plants. By utilizing *Agrobacterium* we can insert our gene of interest; a receptor involved in the ABA signal transduction pathway in its constitutively active (CA) form. We can gain novel insights about the ABA pathway by working with transgenic plants that express CA receptors because transgenic plants have the ability to respond to abiotic stress by signaling ABA, and we can measure its activity using single or multiple mutations in certain receptors. We can test the effect of single or multiple mutations in certain receptors in transgenic plants by stress testing *Arabidopsis thaliana* seedlings by drowning them. By measuring the length of elongation of the primary root after being drowned for a set period of time, the combination of proteins that aid the seedlings in their response to drowning may elucidate. After stress testing different genotypes compared to wild type seedlings, we have established certain trends and responses to drowning stress in our test plants that may be promising. Knowing the positive or negative regulators in the ABA transduction pathway would potentially allow us to create plants that would better respond to environmental stress.

“The complete experience was very motivating for our students and it will certainly cause a positive impact in their desire to attend graduate school. I was also impressed on how well UC Merced students performed at the symposium.”

–Professor Gerardo Diaz, CAMP Faculty Director, UC Merced
Arsenic is a naturally occurring ubiquitous groundwater pollutant affecting millions of people worldwide. Chronic consumption of inorganic arsenic is known to cause serious health effects including cancer, restrictive lung disease, peripheral vascular disease, gangrene, and others illnesses. Arsenic is usually tightly bound to iron minerals, which are ubiquitous in soil and sediments. However, microbial anaerobic respiration can cause arsenic release from soil by altering the geochemistry of arsenic-bearing iron minerals within the soil. In the absence of oxygen microbes can use both arsenic and iron minerals as a terminal electron acceptor. Consequently, arsenic is liberated from a soil-bound form to one that is water-soluble through microbial iron and arsenate reduction resulting in arsenic polluted water. A model iron/arsenic reducer, Shewanella sp. ANA-3, is being used to investigate the molecular biological response to iron and arsenic. Specially, a green fluorescence protein (GFP) transcriptional reporter strain was inserted in the genome of S. ANA-3, downstream of mtr operon (genes essential for iron reduction), in order to further study arsenic’s fate and transport in more complex environment. (i.e mineral rich environment). This mutant strain will be introduced into an artificial soil aggregate system that mimics a true environment. Microscopy will be used to determine the association of metal-reducing Shewanella bacteria with arsenic-bearing minerals and show the spatial and temporal expression of mtr genes relative to arsenic-iron containing minerals. The ability to monitor the fate of arsenic, facilitated by dissimilatory metal reducing bacteria, could aid in the tracking and prevention of arsenic liberation in the environment thus reducing chronic arsenic poisoning.
A 2D-MOT AS A SOURCE OF COLD RUBIDIUM ATOMS
Maryrose Barrios, 5th Year Senior, Physics Major, University of California, Berkeley
Dan Stamper-Kurn, PhD, Department of Physics

This project seeks to construct a system using a two-dimensional magneto-optical trap (2D-MOT) to create a high flux source of ultracold atoms. The preliminary construction of this apparatus employs the use of a differential pumping tube, rectangular anti-Helmholtz coils, diode lasers, and an Alkali metal oven. Through the use of Rb-87 atoms and an individual laser power of 50mW, the production of an atom beam with a flux on the order of $10^{10}$ atoms/sec is estimated. With the 2D-MOT's creation of an effective atom source, a high efficiency of atom transfer to an ultrahigh vacuum (UHV) science chamber via an additional laser push beam is also projected. These numbers hold promise for future applications where a high atom number is required, such as in a 3D-MOT or Fabry-Pérot fiber cavity. Examples such as the stable fiber cavity have the ability to implement new techniques for advancement of the field of quantum measurements. By producing this 2D-MOT as a versatile atom source, the applications to novel experiments enhances the opportunities to investigate fundamental, dynamic processes at the atomic level.

WIRE ELECTRICAL DISCHARGE MACHINING: TOOL-PATH OFFSET OPTIMIZATION FOR A MINIATURE MEDICAL COMPONENT FABRICATION
Destiny R. Garcia, Mechanical Engineering, Senior, University of California, Davis
Kazuo Yamazaki, PhD, Mechanical and Aerospace Engineering

Wire electrical discharge machining (WEDM) is a non-traditional form of manufacturing field that is used to efficiently and accurately cut notoriously difficult-to-machine medical materials such as stainless steel or titanium. Many medical applications, however, require WEDMing of very delicate components, which are subject to deflection and distortion during cutting, due to the high cutting temperatures experienced during the WEDM process. In order to compensate for such geometric changes encountered during WEDMing, the wire motion during cutting operations must be compensated in order to achieve a geometrically accurate and uniform quality component. The purpose of this research project is to predict and compensate for deflection and distortion experience during WEDMing of the delicate medical component fabrication. Goals for this project are aimed at improving the tool path, which will enhance the fabrication of the miniature medical component. We will compare different offset paths from before and after to verify that the new tool path has improved surface finish and quality. Findings from the new tool path offset may be useful in future studies involving other various applications in the industrial field of WEDMing.

“Some of the students are so polished! This event looks more like a graduate or professional session – in fact, some of the students are better than graduate level.”
–Professor Carlos Coimbra, UC San Diego
USING SODIUM SPECTRA FOR TEMPERATURE MEASUREMENT IN A COUNTERFLOW FLAME

Daniel Jaimes, Mechanical and Aerospace Engineering, 5th Year Senior, University of California Irvine

Derek Dunn-Rankin, Ph.D., Mechanical and Aerospace Engineering

The relationship between temperature and the spectral response of sodium has long been used as a non-intrusive method for determining the thermal characteristics of flames. Originally, the sodium D line reversal method for temperature measurement was shown to be reliable, widely applicable, and able to provide unsteady temperature information. The procedure discussed here describes a modified yet similar, non-intrusive sodium-based technique for acquiring temperature profiles in a laminar water/air/methane flame. In this case, a tungsten filament halogen lamp is calibrated using blackbody radiation theory and electrical resistivity principles in order to establish a relationship between power input and filament temperature. In the experimental setup, the calibrated lamp is used as the light source and is projected opposite a spectrometer lens, with the target flame between the source and lens. The thermal excitation of the sodium species in the flame is characterized by significant irradiance measured by the spectrometer at 589.0 and 589.6 nm; these so-called D-lines correspond to a bright yellow color. When the light from the tungsten filaments at these same wavelengths is no longer brighter than the light from the flame sodium, Kirchoff’s law establishes that the corresponding lamp temperature is equivalent to the flame temperature. Since the lamp light traverses the flame, the measurement is a depth integrated average that is particularly useful in steady and one-dimensional flames. Overall, the goal of this experiment is to provide a cost effective, non-invasive method of acquiring bulk temperatures of such flames.
**COMBUSTION INSTABILITY AND ITS INFLUENCE ON DROPLET FLAME BEHAVIOR IN AN ACOUSTICALLY EXCITED FIELD**

Brett Lopez, Aerospace Engineering Major, Senior, University of California, Los Angeles

Ann Karagozian, Ph.D., Department of Mechanical and Aerospace Engineering; Cristhian Sevilla, graduate student mentor

Studying the combustion characteristics of a fuel droplet provides a fundamental understanding of diffusion flames. The knowledge gained can be used to help predict the performance of new alternative fuels. One important aspect of understanding condensed phase combustion is to determine burning characteristics during exposure to oscillations in pressure, an environment commonly encountered in liquid rocket as well as air-breathing propulsion systems. This coupling is the focus of the present experiments involving burning droplets in an acoustic waveguide. When a fuel droplet is exposed to a standing acoustic wave and located near a region of minimum pressure perturbation, known as a pressure node, its combustion characteristics are altered depending on the distance from the pressure node; however, the existing theory does not explain the phenomena completely. It is hypothesized that strong coupling between the pressure oscillation and the heat release rate of the flame is responsible for the theory’s insufficiencies. Utilizing phase locked OH* chemiluminescence imaging and pressure data, the instability characteristics for various alternative liquid fuels with different pressure oscillation frequencies and amplitudes can be tested. Preliminary results for ethanol fuel have shown that the combustion instability is amplified when the droplet is close to the pressure node and is attenuated farther away. Further testing will be conducted on different fuels commonly used in aerospace propulsion systems. Since these fuels have different reaction mechanisms, it is anticipated that the instability characteristics could vary from fuel to fuel.

**OCT-LAPAROSCOPE**

Erika Galvez, Bioengineering Major, Senior, University of California, Riverside

Hyle Park, Ph.D., Department of Bioengineering

Prostate cancer is the second most common type of cancer in men. The prostate lies underneath the bladder and is surrounded by periprostatic nerves. For this research topic, we will be designing and building a laparoscope that can be attached to an optimal coherence tomography machine. The innovative OCT-laparoscope seeks to 1) distinguish among cancerous tissue, benign mutation or bladder, 2) allow non-invasive organ/prostate treatment, and 3) minimize periprostatic nerve damage. The Laparoscope prototype was created by securing thirteen lenses to segmented Plexiglas holders. The 13 mm diameter lens tube framework was then attached to a Galvo system equipped with a collimator and optical fiber port. Ideally, a beam of laser is supposed to reflect off of a Galvanometer mirror and diffract off of each 8mm and 0.5” mm lens with a focal length of 20mm and 30mm respectively. The problem with this existing device is that the Laparoscope is currently secured to the Galvo system with tape, we do not know if the laser is diffracting off of each lens’s optimal angle effectively, there are semi-sharp ridges between each lens segment, and the glue utilized to seal each segment might wear off after each sanitizing treatment thus impeding the longevity of functionality.

If the OCT laparoscope’s faults were repaired, the design prototype would be the first of its kind. The OCT laparoscope potential can be utilized for other minimally invasive procedures and its functionality can be implemented at a low cost while maintaining integrity to the patient’s body.
SYNTHESIS AND CHARACTERIZATION OF NANO-GOLD GOLF-BALLS FOR DRUG DELIVERY, SCAVENGING AND MOLECULAR DETECTION

Alan F. Gomez, Bioengineering, Senior, University of California, San Diego
Ratnesh Lal, Ph.D., Departments of Bioengineering and Mechanical & Aerospace Engineering
Preston Landon, Ph.D., Lal Laboratory for Nano-bio-imaging and Devices, lab mentor
Adam Printz and Christopher Emerson, graduate student mentors

The development of non-toxic, biocompatible nano-vehicles that can avoid detection by the immune system is of paramount importance for the advancement of targeted drug delivery techniques. Such particles have the potential to be used for cell specific drug delivery, blood born scavenging agents and detoxification. The aim of the present investigation is to develop novel nano-particles that can be used as easily detectable vehicles for drug delivery. Spherical gold shell nanoparticles with pores that resemble nanoscale “golf-balls” on silica cores with diameters between 200-1000 nm. have been synthesized in solution. The pores will allow compounds to diffuse into the particle then by sealing the pores the compound can be stored for delivery. The gold shell will protect the stored compound from the immune system allowing it to be delivered to the desired location. The number and diameter of the pores as well as the thickness of the gold shell can be controlled through the syntheses process. This allows the particle’s aspects to be fine-tuned for specific purposes. Similar to colloidal gold these particles also exhibit unique optical properties which allow their presence to be easily detected using optical techniques. The particles were visualized by scanning electron microscopy and their optical properties are under investigation.

“The CAMP students represent one of the most inspiring groups of students that I encounter each year. The posters and research are of the highest academic caliber, and the enthusiasm of the presenters is truly contagious.”

–Dr. Stuart Sandin, Scripps Institution of Oceanography, Member, CAMP Statewide Advisory Board
2013 Symposium Judges

LEAD JUDGE
Derek Dunn-Rankin, Ph.D., Professor and Chair, Mechanical & Aerospace Engineering, UCI

BIOLOGICAL/LIFE SCIENCES
Richard Cardullo, Ph.D., Biology, UCR
Tama Hasson, Ph.D., Biochemistry and Molecular Biology, UCLA
Judy Kjelstrom, Ph.D., Biotechnology, UCD
Lorena Navarro, Ph.D., Microbiology and Molecular Genetics, UCD
Rudy Ortiz, Ph.D., Molecular and Cellular Biology, UCM
Chad Saltikov, Ph.D., Microbiology and Environmental Toxicology, UCSC
Stuart Sandin, Ph.D., Scripps Institution of Oceanography
Masa Watanabe, Ph.D., Natural Sciences, UCM
Gregory Weiss, Ph.D., Chemistry, Molecular Biology and Biochemistry, UCI
Karl Willert, Ph.D., Cellular and Molecular Medicine, UCSD

PHYSICAL SCIENCE / ENGINEERING
Glenn Beltz, Ph.D., Engineering, UCSB
Asmeret Asefaw Berhe, Ph.D., Life and Environmental Sciences, UCM
Adam Burgasser, Ph.D., Physics, UCSD
Carlos Coimbra, Ph.D., Mechanical Engineering, UCSD
Phil Crews, Ph.D., Chemistry and Biochemistry, UCSC
Martin Diaz, Ph.D., Chemistry, Los Angeles Trade Tech College
Oscar Dubon, Ph.D., Chemical Engineering and Materials Science & Engineering, UCB
Amelito Enriquez, Ph.D., Engineering and Mathematics, Canada College
Carlos Fernandez-Pello, Ph.D., Mechanical Engineering, UCB
Teamrat Ghezzehei, Ph.D., Life and Environmental Science, UCM
Ted Holman, Ph.D., Chemistry, UCSC
Lori Lubin, Ph.D., Physics, UCD
Nathaniel Lynd, Ph.D., Materials Research, UCSB
Roummel Marcia, Ph.D., Applied Mathematics, UCM
Erik Menke, Ph.D., Materials Chemistry, UCM
Ken Millett, Ph.D., Mathematics, UCSD
Kalyanasundaram Seshadri, Ph.D., Mechanical and Aerospace Engineering, UCSD
Jorge Torres, Ph.D., Chemistry and Biochemistry, UCLA
JUDGING CRITERIA

- **Research Content**: Significance and quality of the project topic and execution
- **Research Contribution**: Student’s articulated contribution to the work
- **Poster Visual Quality**: Layout and content, use of graphics and images, appropriate references
- **Student Presenter**: Demeanor, enthusiasm, engagement, response to questions

SELECTED JUDGES COMMENTS

- Good introduction of motivation for the project. Make sure captions are consistent with the figures (colors in images vs. what’s in the caption). Do a spell check to look for typos.
- Great presentation. Good understanding of overall project. A little too much text on the poster; slow down a little when speaking! Impressive amount of work done on the project.
- Exceptional understanding and presentation. Excellent overall. Keep it up!
- Very interesting/challenging project in its early stages – great discussion. Student is poised and engaged.
- Student’s love of the work really shows (big positive). Should be more quantitative with results.
- Extremely well-presented poster. High research content. Highly original and topic came directly from student.
- It would be useful to focus the presentation into a few important topics – presentation was too spread out and wide at times.
- Start by explaining significance of the work, then what specific issue/question you are addressing in your work and what methods you used. Cite references appropriately.
- Very nice poster layout. A bit nervous. Bulleted Intro would had improved ease of reading.
- Next time, I’d suggest numbering your figures and adding titles and conclusions. Try to also label your figures more fully.
- Very enthusiastic member of a research lab. Seems to play a key role in lab. Could be good for her to get more familiar with her results in the bigger context of the team.
- Interesting results with real world application. Keep up the good work.
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2013 Symposium Keynote Speakers

A Trip to the Very Bottom of the World: South Pole, Antarctica!

DR. DON BLAKE
Distinguished Professor of Chemistry, UCI

University of California Chemistry Professor Donald Blake’s research centers on identifying and quantifying very low concentrations of gases in air. The trace gases measured by his research group affect stratospheric ozone concentrations, are greenhouse gases, or participate in local and regional photochemistry. Samples are collected on the surface, on ships, and/or on aircraft. His research has taken him from the North Pole to the South Pole and locations in between. His current atmospheric focus is in the Central Valley of California, China, and Saudi Arabia. Previously he tested the air quality of Beijing, prior to the Olympics.

In 2001 his research branched off and his group began studying gases found in exhaled human breath. The aim was to identify and quantify gases that were specific to individual diseases. Leukemia, diabetes, renal failure, pulmonary infection and sepsis are currently studied in his laboratory. He has mentored many students throughout his career, including undergraduates and community college students as well as graduate students. Mentees participate in various aspects of the exhaled human breath research, air quality sampling, and related opportunities to generally engage in analytical, atmospheric and environmental chemistry.

In 2010, Don Blake was identified as one of the 250 most cited professors in the world during the two decade period of 1990-2010.

Dr. Blake was selected to receive the American Chemical Society’s 2013 National Award for Creative Advances in Environmental Science & Technology. The award was presented at the ACS Annual Meeting in April in New Orleans. Over the last 30 years, Dr. Blake’s air samples have shed light on the quantification of greenhouse gases, gases affecting stratospheric ozone levels, and those causing urban smog formation.
Dr. Lamar Blackwell completed a Ph.D. in Biological Sciences at UC Irvine in March 2011. While at UCI, he studied signal transduction cascades in the Mitogen Activated Protein Kinase cascade. He was acknowledged for excellence in graduate research by winning the 2010 American Association for the Advancement of Science (AAAS) poster competition. He was invited to speak at California State University Los Angeles as part of their STEM seminar series. During his academic career, Blackwell received two fellowships from the National Science Foundation. He was also awarded a Howard Hughes travel grant for serving as an exceptional teaching assistant to undergraduate students.

Dr. Blackwell has maintained interest in advancing the undergraduate and graduate experience at UCI. While at UCI, he served as a member of UCI Advisory Council on Diversity Committee. He worked with several programs to help undergraduate students understand how to read scientific papers effectively and ask good scientific questions. He also served on numerous committees and graduate student panels. He tells students, “There is no substitute for a strong work ethic.” Moreover, Dr. Blackwell has partnered with teachers at high schools in Orange County to bring innovation in teaching biology. Additionally, he is an advanced communicator in Toastmasters International and tutors undergraduate students in chemistry and biology in his spare time.

Dr. Blackwell accepted a postdoctoral scientist position at Cedars Sinai Medical Center in Los Angeles, for which he received two fellowships to support his research. He studies mechanisms that relate elevated blood pressure with increased inflammation in mice and is an author on several publications.
An Alumni Meet-and-Greet reception was held September 27, 2012 at the UCI Student Center, welcoming alumni back to campus. The event was coordinated by CAMP Statewide and UCI-CAMP, answering a challenge put forward by the CAMP Statewide Advisory Board at its February 2012 meeting. The reception was the first formal alumni gathering for UCI-CAMP over its more than 20-year span, and served as a model for partner UCs.

Dr. Derek Dunn-Rankin, Chair of Mechanical and Aerospace Engineering and CAMP Statewide Co-Director, was emcee for the evening. He shared his thoughts on the long-term impact of student participation in CAMP activities, especially research, and the collective achievements of all those present.

“Besides being just a lot of fun,” Dunn-Rankin says, “gatherings of multiple academic generations of this kind are extremely valuable in showing the importance of sustained commitment to excellence that NSF has afforded CAMP.” He adds, “Connecting recent graduates with those having longer experience helps everyone recognize the depth and breadth of the CAMP scholar network.”

Dr. Derek Dunn-Rankin, Professor and Chair, Mechanical and Aerospace Engineering, shares a moment with Jezabel Rios (Class of 2005, Mechanical Engineering), who is a structural dynamics engineer for Boeing. Rios had conducted undergraduate research under Dr. Dunn-Rankin.

Jason Tompkins, Class of 2000, Economics, Program Advisor for the Executive and Health Care Executive MBA Programs at UCI; and Dr. Hector Lastra, Class of 1999, Biological Sciences, a Pediatrician at HealthCare Partners in Huntington Park, East Los Angeles.

Dr. Daniel Vera (UCI Class of 2002) and Dr. Philippe Relouzat, who judged CAMP research posters for many years. Both are Mathematicians!

Above, Jennifer Gan, M.B.A., CAMP Statewide program specialist; Leonora Peña, CAMP-UCI program specialist; and Viviana Ramos, Center for Educational Partnerships, enjoyed conversations at the reunion. Leonora Peña and Viviana Ramos are CAMP Alumni.

Smiles all around for these Alumni who exchanged current contact information and recent accomplishments.
Dr. Don Blake, Professor of Chemistry (Analytical, Atmospheric and Environmental), was the keynote speaker, giving his remarks as a “proud mentor” and sharing the academic benchmarks of female students, particularly CAMP students, who have gone on to careers in science, medicine, and law. Dr. Blake said that the students shared a common attribute: a great work ethic. They inspired him to continue mentoring undergraduates from the CAMP program, citing their motivation, dedication, and will to sacrifice in order to succeed.

“I love this program,” Dr. Blake said. “I have had wonderful students over the years and they have made me extremely proud. Their experiences growing up forged them into caring, hard working, determined, and focused individuals.” He emphasized, “The CAMP program provided a platform from which these students were able to spread their wings and fly.”

Dr. Blake is the lead scientist at the Rowland/Blake Lab, where they study atmospheric contaminants (greenhouse gases) around the world, including over Antarctica, and over Beijing during the 2008 Olympics. He has taken several students in the NASA research plane to collect air samples.

Additionally, Dr. Kenneth Janda, Dean, UCI School of Physical Sciences, welcomed the alumni and related some of his mentoring experiences. Dr. Janda supports CAMP program goals for undergraduate achievement in many capacities, including before and during his role as Dean. He has served as a judge at the CAMP Statewide Undergraduate Research Symposium and consistently participates in CAMP-UCI activities and events.

“Undergraduate research helped to jump-start my career, and I am delighted to provide the same opportunity to UC Irvine students. I am particularly proud of my most recent CAMP student, Joel Rivera, with whom I just
Representing the CAMP Statewide Advisory Board was Aaron Soto, a UCI alumnus and Huntington Beach IT business owner, DezTech Consulting LLC, since 1998. Soto presented the idea to bring alumni together to leverage the program efforts for today’s CAMP students. He spoke about the need to connect alumni with current students, especially through e-mentoring.

UCI-CAMP Director Kika Friend introduced Jose Varias, representing UCI alumnus Jose Valle (Class of 2000, Civil Engineering), who donated $10,000 to support CAMP at UC Irvine. The generous donation will fund additional summer researchers. Kika Friend also shared her thoughts and experiences mentoring students over many years and expressed appreciation to the alumni for being part of the CAMP family and enriching the program’s success story.

The event had three main goals: to engage alumni in mentoring and e-mentoring activities, to encourage alumni to participate in career panels and seminars or workshops, and to foster internship and career opportunities for current STEM majors and new graduates.

Special guests included Dr. Ron Stern, former Dean, School of Physical Sciences, and Sharon Stern, senior lecturer, College of Health Sciences, who mentored numerous students over the years; Dr. Juan Francisco Lara, Assistant Vice Chancellor Emeritus and current Statewide Advisory Board member, who

“...as someone that benefitted tremendously from the CAMP program through the mentorship of my peer predecessors and then mentoring those that followed me, it was an amazing experience to gather so many great success stories and appreciate the strands of mentoring lineage throughout the room made possible by the CAMP program.”

—Aaron M. Soto, CAMP alumnus, Partner, DezTech Consulting LLC
Dr. Stephanie Reyes-Tuccio, Director, Center for Educational Partnerships, showed her enthusiastic support for the program by greeting many of the alumni who attended.

Approximately 60 alumni enjoyed the fellowship, catching up on each other's careers, interests and family life. Outreach to alumni was made through Facebook and other social media as well as personal contact. Although many alumni are living and working throughout the State of California and the nation, more than 300 alumni “Liked” the Meet-and-Greet concept on Facebook! Nearly all who attended signed up for one of the proposed future activities, particularly mentoring and giving back by sharing their academic and career experiences and expertise.

contributed significantly to the initial CAMP proposal to the National Science Foundation and served CAMP in various capacities; Dr. Arnold Guerra, UCI Alumnus and Professor of Physics at Orange Coast College; Dr. Stephanie Reyes-Tuccio, Director, UCI Center for Educational Partnerships (home of CAMP Statewide office), who leads an array of early academic outreach programs supporting underrepresented minorities in the college pathway; and Dr. Philippe Relouzat, mathematics mentor and instructor for the CAMP Summer Science Academy as well as judge for the annual CAMP Statewide Undergraduate Research Symposium.

Also attending were Dr. Jose Romero-Mariona, UCI Bridge to the Doctorate Fellow (UCI Ph.D. Information and Computer Science 2010) who conducts research in the area of cybersecurity at the U.S. Navy SPAWAR (Space and Naval Warfare Systems Command) in San Diego, and Dr. Daniel Vera (MIT Ph.D. Mathematics; UCI Class of 2002 Magna Cum Laude), analyst for Picoco LLC, Newport Beach; and Dr. Brandon Brown (Ph.D. Johns Hopkins University International Health, UCI Class of 2004), who recently joined the faculty in health sciences at UCI. Also participating were Julie Marquez, M.D. (Class of 1998), an emergency medicine physician at Kaiser Permanente in Bellflower CA, Hector Lastra, M.D. (Class of 1999), a pediatrician in Huntington Park, and Jose Mayorga, M.D. (Class of 1999), a family medicine physician in Costa Mesa, CA. Dr. Mayorga is the Medical Director at Share Our Selves (SOS), a non-profit organization founded to provide for the most serious concerns of the poor. Dr. Mayorga has a passion for helping those in need with the highest quality in health care. He finds time to mentor high school, pre-med, and medical students interested in the health care field.
UC Berkeley Welcomes 12 STEM Graduate Students on Path to the Ph.D.

UC Berkeley’s proposal to the National Science Foundation to host the newest cohort of Bridge to the Doctorate was successfully reviewed and funded August 2012 through August 2014. Nationwide recruitment was conducted through innovative online platforms, resulting in a dynamic cohort of graduate students across an array of STEM disciplines. Recruitment and implementation were accomplished by collaboration with Cal NERDS (diversity program umbrella and home of CAMP-NSF), the Graduate Division, and the STEM deans and departments. The Bridge to the Doctorate activity provides a rich set of graduate student development opportunities, which in addition to rigorous training in specific STEM disciplines also includes on-going faculty mentoring, professional development, and activities that promote networking and leadership in the scientific and engineering communities. The nurturing and supportive environment will ensure successful completion of the Ph.D. and transition to competitive careers.
The BD activity advances the goal of creating a permanent shift in the pipeline leading to graduate school at UC Berkeley. BD students will be engaged in mentoring STEM undergraduates to bolster excitement for STEM majors. The BD cohort is anticipated to affect not only the perceptions of the next generation of URM STEM students, for whom they will serve as role models, but ultimately expand participation in the U.S. STEM workforce. Our findings, lessons learned, and impact of our activities will be disseminated through social networks, webinars, publications, national meetings, and data sharing processes with NSF-affiliated initiatives and diversity consortiums. BD students are expected to have a vital and transformative impact far beyond the host campus.

Goals and Objectives
California LSAMP BD will draw on the strengths of a vibrant academic community at UC Berkeley whose collaborative efforts will go far to ensure that the goals of the Louis Stokes Alliance for Minority Participation Bridge to the Doctorate (LSAMP-BD) are met. The main objectives are to:
- Create a welcoming and supportive academic community for these fellows. Access to a 24x7 student center where they can meet and work together. This includes strong networks within the research community, department, as well as an inclusive graduate student community. This academic community will provide research, mentorship, professional development, academic support, and leadership opportunities leading to a professional STEM career in an academic, government, or industrial setting;
- Promote and practice ethical and intellectual values consistent with emerging leaders in the STEM professions including strength through diversity, teamwork, and mentorship;
- Partner with UC Berkeley STEM departments and colleges to identify and implement best practices for recruiting, retaining, and graduating STEM graduate students – through assessment, evaluation, and dissemination of California LSAMP BD formative and summative student outcomes;
- Graduate the twelve California LSAMP BD fellows.

BD Activities
During their first two years, the Bridge to Doctorate Fellows are actively engaged in coursework and research activities consistent with the expectations of all graduate students. At the same time, students will be involved in specific activities that are required of LSAMP BD Fellows.

Professional Development Activities - Workshop Topics:
- How to thrive your first year of graduate school
- Ten things I wish I had/hadn’t done: A graduate student panel
- Research group meetings (how to prepare, contribute, and be heard)
- Ethics/Integrity/Success
- Getting the most from your PI interactions
- External funding fellowship application information

The UC Berkeley BD Fellows

- Kene Akametalu, Electrical Engineering & Computer Science
  B.S. 2011, University of California, Santa Barbara
- Stephen Alvarez, Material Science Engineering
  B.S. 2010, University of Puerto Rico, Mayaguez
- Lacey Andrews, Endocrinology
  B.S. 2012, Rochester Institute of Technology
- Edy Cardona, Materials Science Engineering
  B.S. 2011, University of California, Berkeley
- Karina Chavarria, Civil Engineering
  B.S. 2012, University of California, Los Angeles
- Ebuka Chukwuebuka, Civil Engineering
  B.S. 2012, University of California, Davis
- Michael Alberto Gomez, Microbiology
  B.S. 2012, University of California, Los Angeles
- Monica Hernandez, Plant Biology
  B.S. 2012, University of California, Los Angeles
- Maribel Jaquez-Nunez, Mechanical Engineering
  B.S. 2012, University of California, Irvine
- Mireille Kamariza, Molecular and Cellular Biology
  B.S. 2008, University of Puerto Rico, Cayey
- Jesyka Melendez-Rosa, Integrative Biology
  B.S. 2012, University of California, San Diego
- Brian Shevitski, Physics
  B.S. 2012, University of California, Los Angeles
Academic writing and publications
Post-graduate planning: strategizing for success
Library skill resources and development
Balancing work and life
Academic search and preparation
Nailing the job talk
Getting the most out of a professional conference
Research Institute presentations
Writing successful grant proposals (NSF focus)
Post-doctoral opportunities
Sexual harassment prevention workshop

Presentation Skills:
Workshops on public speaking and presentation skills
A brown bag research presentation series
Hands-on research presentation development and one-on-one PowerPoint training
Funding trainee travel to conferences and symposia with practice talks prior to those trips

Writing and Communication:
BD fellows will receive instruction from the Graduate Division’s Academic Services Unit in the writing of graduate academic documents, including proposals, theses, articles for publication, CVs and grant applications for extramural funding.
BD fellows will have the option of taking a two unit course on academic writing for graduate students, and/or a series of workshops on the above topics.
During the last year of their doctoral studies, BD Fellows will be encouraged to participate in the Summer Institute for Preparing Future Faculty, sponsored by the Graduate Division. The institute, a collaboration between the Academic Services Unit and the Graduate Student Instructor Teaching and Resource Center, offers a six-week program for students preparing for future academic positions. Fellows enroll in the core course, “From Graduate Student to Faculty Member,” and one elective either “Developing a Teaching Portfolio” or “Editing, Academic Writing, and Academic Publishing.”
With additional financial support from their college, department, or advisor, LSAMP BD Fellows will attend one professional meeting by the end of their second year and engage in networking activities with STEM scientists.
At the end of the second year, all California LSAMP BD Fellows will submit both a written and oral report of their academic and professional development activities. The oral report will be a presentation given during the last semester.

UC BERKELEY BD LEADERSHIP

Carlos Fernandez-Pello serves as PI. He is Professor, Department of Mechanical Engineering, the Almy C. Maynard and Agnes Offield Maynard Endowed Chair of Mechanical Engineering, and Associate Dean of the Graduate Division at UC Berkeley. He received degrees of Doctor Aeronautical Engineer from the University of Madrid, Spain, and a Ph.D. in Engineering Sciences from the University of California, San Diego.

Diana Lizarraga, Director of the Cal NERDS program is also an LSAMP UC Davis Alum who earned a B.S. in Agricultural Systems and Environment. She received an M.S. degree at the University of San Francisco in Human Resources and Organizational Development. Lizarraga directs an array of diversity science research programs under the Cal NERDS umbrella, including the NSF LSAMP, and coordinates the BD activity. She is the “hands-on, go-to person” for the BD effort.

Carla Trujillo, Director of the Graduate Diversity Program, earned a Ph.D. in Educational Psychology from the University of Wisconsin-Madison. Trujillo delivers the workshops and other professional development activities outlined in the proposal, in conjunction with the Graduate Division.

Steven Chin, Ph.D., Science and Mathematics Education, UC Berkeley; Director, Professional Development Program (PDP) since 1988. Promoting diversity and excellence from pre-college through graduate school, PDP partners with departments and colleges across the UC system to increase the number of underrepresented students in STEM. Chin will lead the data and evaluation components of the proposal.

Cynthia Ladd-Viti is the Graduate Diversity Program’s Outreach/Summer Research Program Coordinator and co-coordinator of an NSF REU in the department of Psychology. She is a former re-entry student at UC Berkeley, graduating with honors with a B.A. in American Studies.
CAMP Welcomes UC Merced!

UC Merced joined the California Alliance for Minority Participation in Fall 2011, under the Senior Alliance proposal funded through 2016 by the National Science Foundation. The faculty director is Dr. Gerardo Diaz, Professor of Engineering. Dr. Tony Jimenez, CAMP Coordinator, provides vital leadership and vision, as seen by his vigorous research scholars program launched in summer 2012.

UC Merced is the first new American research university in the 21st century, with a mission of research, teaching and service. The campus opened September 5, 2005, in the Central Valley of California. The university is about an hour north of Fresno, two hours south of Sacramento, two hours southeast of San Francisco and the Silicon Valley, and 90 minutes west of Yosemite National Park. The CAMP program is the latest example of student opportunity efforts at UCM that support retention, student development, degree completion and continuation into graduate education.

INTRODUCING UC MERCED’S CAMP FACULTY DIRECTOR GERARDO DIAZ, PH.D.

Gerardo Diaz is Associate Professor and Chair of Mechanical Engineering at UC Merced. He received his undergraduate degree in mechanical engineering from University of Santiago, Chile, and an M.S. and Ph.D. from the University of Notre Dame in 1999 and 2000, respectively. Diaz worked for four years at the Research and Development department of Modine, a company dedicated to heat transfer solutions. In 2004, he joined Honeywell International in Torrance, California, working in environmental controls systems for different aircraft platforms. In 2005 he became a founding faculty member at UC Merced. Diaz is the Director of the Sustainable Plasma Gasification Laboratory and he is affiliated with the Energy Research Institute (UC Solar and UC MERI).

INTRODUCING CAMP COORDINATOR TONY JIMENEZ, PH.D.

Tony Jimenez received his undergraduate degree from the University of California at Santa Cruz. He went on to earn his masters degree, with an emphasis in Administration, Planning, and Social Policy from Harvard University. While at Harvard, Jimenez worked on issues of diversity, access, and equity in the UC System under the guidance of Dr. Gary Orfield, formerly the co-director of the Harvard University Civil Rights Project. While at Harvard, he researched the effects of the elimination of affirmative action at UC Berkeley, UCLA, and UC San Diego. After completing his masters Jimenez earned his Ph.D. in Educational Policy Studies at the University of Illinois. His doctoral research focused on the effects of the elimination of affirmative action admission programs for African Americans and Jimenez continues on page 31.

UC MERCED FAST FACTS 2012

- Undergraduates: 5,431
- Graduate students: 329
- The School of Natural Science has the second largest number of undergraduate majors with 2,001, followed by Engineering with 1,022.
- Hispanics comprise the largest group by ethnicity with nearly 2,200 students
- Ladder Rank faculty: 153
- Lecturers: 153
- Other Academic Appointments: 70

Azucena Robles was featured in the UC Merced brochure! The Mechanical Engineering major appeared in our 2012 Proceedings & Profiles publication, but little did she know that her photo in the lab would be prominently displayed in the UCM recruiting piece and on the UCM website. Robles received Honorable Mention for her research, “Temperature Measurements of an Electrolytic Tank under Normal Electrolysis an Glow Discharge.” She plans to become a future university professor.
UC MERced STUDENT SPOTLIGHT

Jamie Sweet: Environmental Engineer in the Making

UC Merced’s Jamie Sweet is a junior working toward a B.S. degree in Environmental Engineering. She has big plans for her professional career and is building a foundation in leadership through her role as Chapter President of the National Society of Black Engineers (NSBE) and as an engaged member of the Society of Women Engineers (SWE).

She is involved in service learning, creating exhibits for the Castle Science & Technology Center, and is an undergraduate researcher working under the supervision of her faculty mentor, Professor Teamrat Ghezzehei, Environmental Soil Physics. Sweet studied water retention by root mucilage on a project titled, “Experimental Investigation on the Role of Root Mucilage on Soil-Water Retention Dynamics.” Among her tasks was to calibrate water sensors to produce the most accurate data. She has enjoyed meeting people that she otherwise would not have interacted with, if not for engaging in the research experience.

Not only is Sweet focused on her own academic advancement, but she also works to ensure that other engineering majors are progressing academically as well. She has as a special focus in NSBE to raise the GPA of its members through activities such as small group study and exam preparation workshops. She is preparing and planning for graduate education, keeping her options open, perhaps relocating to the Midwest.

“As Jamie is a superstar!” Dr. Tony Jimenez, CAMP Program Coordinator for UCM says. “As part of the first CAMP cohort, Jamie is a trailblazer and has become an undergraduate leader in STEM at UC Merced.” He adds, “I have no doubt that she will earn her PhD and be a leader in her field.”
JAMIE SWEET: FIRST PERSON

What do you have in mind for your career goal?

I hope to go into a field of water toxicology or pedology (soils in their natural environment).

What excites you most about your major in environmental engineering?

Well, I have always enjoyed math and science so coming out of high school I knew that I wanted to major in engineering. I chose environmental because it’s a very innovative field that is on the rise. It excites me because people are always trying to figure out easier and better ways to do things, and it’s amazing how we can use the simple resources that we already have to make the biggest differences. I think this is mostly displayed with solar panels and wind turbines. Sunlight and wind are always going to occur so it’s cool that we can find a use for that type of energy.

Please share your thoughts on summer research—how did you benefit and grow as a student and future professional engineer?

Summer research is awesome! Your mentor and lab partners expect you to know certain things and it feels great to actually reference back to that chemistry class you took last semester and put your knowledge to good use. This opportunity allowed me to venture into a field and meet people that I would not have been able to do without CAMP. It enhanced my professional skills along with my public speaking skills, and allowed me to learn about the interests of my peers through their research.

Can you list one or two goals you have set for the NSBE chapter for which you serve as president—and for SWE?

I am more involved with NSBE so I can speak better on that organization. A couple of my goals for this year are to increase our overall chapter GPA through study nights and our Retention Program, and to continue developing professional leaders on a chapter and regional level through our Shadowing Initiative program.

What do you like most about UC Merced?

My favorite thing about UC Merced is the size of the student body and accessibility to my professors. Although the classes are tough, faculty are always willing to help you with your studies and go the extra mile to help you succeed. For those considering applying to UCM, I would tell them to do it! People from UCM say it all the time, but it’s true that at such a small and new campus there is such a diverse community that you can be part of and set the foundation for years to come!

Who inspires you?

My parents and my aunt. My parents have been giving me advice for years, but I don’t think I actually heard them until after freshmen year of college. I remember when I was little I thought they were geniuses, I still do. Besides my parents, my aunt is the smartest, self-driven person I know. All of my family live in the Midwest, and she is the oldest of all her siblings. When she was 19 she decided she wanted to move to California (where we had no family), not only did she finish her education, but started two businesses of her own. She inspires me to be my own trend-setter and to always to do what I feel is right.

Where do you see yourself in 10 years?

At age 31 I hope to be in the prime or almost prime of my career and with a family of my own.

Do you plan on graduate education in the future?

Definitely, I am looking into graduate programs now!

CAMP COORDINATOR TONY JIMENEZ continued from page 29

Chicano/Latinos at UCLA. Tony was mentored by Dr. Laurence Parker formerly from the University of Illinois and by Dr. Daniel Solorzano, Professor of Education at UCLA and Director of UC ACCORD (All Campus Consortium On Research for Diversity). Jimenez has published and presented on issues of diversity, higher educational policy, and access. He also served as part of the American Educational Research Association Evaluation team. While at Illinois, Jimenez was the coordinator of the MD/PhD program at the University of Illinois College of Medicine. Among his achievements, he was able to increase significantly the number of first generation and underrepresented students into the MD/PhD program.

In addition to CAMP-NSF at Merced, Jimenez coordinates the University of California Leadership Excellence through Advanced Degrees (UC LEADS) program. Dr. Jimenez is a first generation college graduate from South East San Diego, a working class multi-ethnic and cultural community in Southern California. He is the first in his family to earn graduate degrees.
Francisco Sarabia, B.S. Pharmaceutical Chemistry, 2013, participated in the 2012 Pharmaceutical Chemistry Study Abroad Program organized by the UC Davis Education Abroad Center. Through this international collaboration, Sarabia was able to study and conduct research at Academia Sinica, one of the top 20 research institutions in the world. The road to Taipei was paved with a strong work ethic and high aspirations, beginning in the freshman year.

Sarabia had learned that in order to qualify he first needed to conduct research with a UC Davis chemistry professor who had an established collaboration with a colleague at Academia Sinica. In his initial research experience, he worked under the supervision of Dr. Louise A. Berben in the synthetic physical inorganic chemistry laboratory. Dr. Berben’s group specializes in the design, synthesis and characterization of new molecules.

“I worked on a project that focused on using redox active aluminum complex to activate and reduce carbon dioxide,” Sarabia says. The project’s goal was “to create renewable energy.”

After a year in the Berben lab Sarabia pursued a more interdisciplinary field, and subsequently joined the bio-physical chemistry lab of Dr. Michael Toney. For two quarters Sarabia worked on a project focusing on “understanding the kinetics of a mutant enzyme,” where he gained essential skills in biochemistry research.

Networking, personal interactions and persistence laid the foundation for further professional development. Previously, at the SACNAS national conference, he met Dr. Jared Shaw, assistant professor of chemistry at UC Davis, sharing his interest in the field of chemical biology – with an eye on studying abroad. Fortuitously, Dr. Shaw had a collaborator at Academia Sinica, and a place in his lab for Sarabia, where he could hone his skills in preparation for an experience abroad.

Sarabia was mainly involved in chemical biology, beginning a long-term project in the study of “a protein called FtsZ that...”
has to do with bacterial-cell division." He explored the synthesis of various analogs in order to understand the structure-activity relationship of the protein, hopefully "to create a new class of antimicrobials that could prevent infection."

From there he made the leap to the research institute in Taipei, where, he says, "I worked with an amazing fluorescence microscope with which I could see the protein FtsZ, bright and yellow, at the middle of a bacterial cell preparing to divide the cell."

He also took various courses in his major including two pharmaceutical chemistry courses, an advanced bio-organic chemistry lab, and a conversational Mandarin course. He says, "It was definitely a culture shock." Not unlike the culture shock of first attending UC Davis, having come from a Latino community in South Bay San Diego. The experience in Taipei opened his eyes and "reconfirmed" that despite language or geography, "science is universal and people can communicate through science."

In Fall 2013, Sarabia plans to enroll in a PhD program in organic chemistry.

“Science is universal and people can communicate through science.”
Community college transfer students historically have difficulty acclimating to the rigorous demands of the quarter system, and the steep expectations placed on them to adapt, excel and graduate on time. With support from CAMP, UCLA’s Undergraduate Research Center (URC) – Sciences offers resources and scholarships that prepare transfer students to advance into capstone research programs and pursue graduate school. The UCLA Bridges program is committed to diversifying the biomedical research field by “bridging” the research gap between local community college students and UCLA by exposing them to research via seminars, panels, and courses aimed at increasing their research abilities and professional development. The program culminates in an eight-week Bridges Summer Undergraduate Research Program (BriSURP) for students who are transferring to UCLA or to another four-year university.

The five UCLA 2013 CAMP Statewide Symposia awardees reflect the successes of programs and initiatives aimed at assisting STEM transfer students set forth by programs like CAMP. This year, Steve Guzman and Walter Hardesty received Honorable Mentions, and Brett Lopez, Brian Perez and Kenny Robles received Special Merit Awards for their presentations in their respective fields. All five winners are transfer students and are currently affiliated with at least one URC undergraduate research program, including CAMP.

Steve Guzman, a former BriSURPer, is currently a MARC (Minority Access to Research Careers) Scholar who conducts research in the Department of Integrative Biology and Physiology. His research investigates the recovery of upper limb motor function in Rhesus Monkeys after spinal injury. Guzman feels the Bridges Summer Undergraduate Research Program helped facilitate his adjustment to UCLA. The program allowed him to gain confidence in his abilities both as a student and researcher by opening doors and introducing him to mentors.

Walter Hardesty is a former BriSURPer and a current IMSD-funded CARE Fellow, working in...
SPOTLIGHT ON CAROLINE ARELLANO-GARCIA:
Community College Student on Pathway to the Baccalaureate

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Charles Arellano-Garcia currently studies Human Biology & Society at Los Angeles Valley College, and plans on transferring to a four-year institution starting Fall 2013. Arellano-Garcia presented during the Works-In-Progress Session at the 2013 CAMP Statewide Symposium, after which she admits, “CAMP definitely exceeded my expectations. I never expected such a wonderful first experience!” She adds that she felt “immense pride” as the only UCLA female presenter as well as the only presenter currently at a community college. “I cannot wait to see what the future holds for all of us.”

She has set high aspirations for herself, including pursuing graduate education. Arellano-Garcia would like to pursue a career in biomedical research and give tribute to the opportunities presented to her by actively promoting the participation of underrepresented minority groups and women in the STEM fields, particularly at the community college level.

“I cannot wait to see what the future holds.”

The Department of Immunology, and Molecular Genetics. His research examines the role of carbonic anhydrase in cAMP signaling and social motility in Trypanosoma brucei. When asked about his experience at the symposium, Hardesty offered, “[CAMP] inspired me to continue to pursue my research goals. By interacting face to face with top scientists in the field of microbiology, not only was I able to learn more about my research, but I became motivated to ask myself more scientific questions and bring these same questions to light in my lab.”

The experience at the CAMP Symposium illustrates an essential factor pivotal for inspiring undergraduates to pursue research careers. Kenny Robles, a former BriSURPer, conducted research last summer at the National Institute of Dental and Craniofacial Research focusing on fibroblast growth factors signaling and the role it plays in impairing innervation of the submandibular gland. He says, “CAMP reinforced my interest in pursuing research in the future.” Robles plans to attend the University of Southern California for Dental Surgery in Fall 2013.

The CAMP Symposium also exemplifies the small community wherein scientists gather from their respective backgrounds to both share and contribute knowledge and fervor for research. Current MARC Scholar, Brian Perez, who won the Special Merit Award, investigates epidermal induction mediated through multivesicular endosomes in the Department of Biological Chemistry. He admits CAMP “motivated me to work harder.”

Brett Lopez is an IMSD-funded CARE Scholar, who won a special Special Merit Award for his work in the physical sciences. Lopez investigates combustion instability and its influence on droplet flame behavior in acoustically excited fields.

Because of the opportunities CAMP presents to the underrepresented and transfer student population, the UCLA awardees have set their ambitions to contribute and commit themselves to “serve the underserved community,” as Robles states.

Thanks to CAMP and programs like it, UCLA can continue to outreach and mentor transfer students in the STEM field. UCLA genuinely appreciates CAMP’s significant impact on undergraduates and is equally committed to its mission to extend opportunity to underrepresented students in the sciences.

—Article provided by Benjamin Hà.
UCLA INTRODUCES:

New CAMP Director, Diana Azurdia

Diana Azurdia, Ph.D., was recently appointed Director of CAMP at UCLA, under the direction of Director and Assistant Vice Provost of Undergraduate Research, Dr. Tama Hasson. She leads a number of undergraduate research programs and teaches Honors College Research Courses. She received her B.S. in Biochemistry from CSU Los Angeles. In 2010 she graduated with her Ph.D. in Molecular Biology and Biochemistry from UCLA. Her graduate school research focused on characterizing the regulation of the riboflavin pathway in E. coli. Upon graduating Diana was appointed adjunct faculty in the Chemistry and Biochemistry Department at CSU Los Angeles. She also served as an assistant teaching instructor in the Chemistry and Biochemistry Department at UCLA.

Diana’s journey with undergraduate research began as a MARC scholar at California State University, Los Angeles. Her passion for research grew amidst a very nurturing and welcoming environment. The support from her mentors and the financial support granted by LSAMP programs set her well on the path to complete the Ph.D.

UCLA FACULTY SPOTLIGHT:

Dr. Jorge Torres

Dr. Jorge Torres, member of the Jonsson Comprehensive Cancer Center and assistant professor in the chemistry and biochemistry department at UCLA, is CAMP alumnus from UC Santa Barbara. He participated in CAMP as an undergraduate at UCSB where his initial research experience dealt with the Tetrahymena thermophila Genome Project in the lab of Dr. Eduardo Orias. (See page 39.) The UCSB CAMPers made it a habit to meet on a weekly basis over lunch to discuss and receive feedback on their work. The guidance, training and opportunities provided by CAMP prepared him for candidacy in competitive research institutions early on in his career.

From UCSB, Torres went on to complete a Ph.D. at Princeton University, Department of Molecular Biology. He was a postdoctoral fellow at Stanford University, Department of Pathology, and at Genentech Inc, South San Francisco, Department of Tumor Biology and Angiogenesis.

Recently, Torres’s research has received much notoriety due to his identification of a novel protein called STARD9. Using high throughput proteomic and genetic screens, his research group sought to identify a protein that when depleted stopped cancer cell division and prompted cell death. The result of their discovery was STARD9, a molecular motor involved in cell division. Further studies showed that depleting STARD9 also helped Taxol, the commonly used chemotherapy drug, to work more effectively against certain cancers. Torres was named one of thirteen 2013 Cottrell Scholars by the Research Corporation for Science Advancement (RCSA), recognizing his scientific contributions to research and his commitment to undergraduate education.

Torres credits much of his success to CAMP and says it “really kick-started my independent science career by giving me the confidence, skills, and training needed to succeed.”

“One of the main things that I gained from the CAMP program was an appreciation of the importance of having a network of dedicated mentors, program directors and staff.”
STUDENT SPOTLIGHT: IN THEIR OWN WORDS

UC Irvine

Daniel Jaimes
Mechanical and Aerospace Engineering

I graduate in June 2013 with a double major in Mechanical and Aerospace Engineering. For the past three years, I have conducted research in combustion at UC Irvine and have presented my findings in poster and oral form at many national conferences. I am also passionate about helping my community and volunteer my time by mentoring and tutoring underrepresented minorities in STEM. These various positions have prepared me for the responsibilities of graduate school, the professional world and holding leadership positions throughout my career. I am planning to attend graduate school and obtain a Masters and PhD in fluid mechanics and thermodynamics, while also contributing to the scientific community as an influential part of the Aerospace industry. I hope to continue to learn more about the fields of engineering that I have grown a passion for and at the same time give back to the community that has continuously supported me throughout my career.

Nicolas Seranio
Biological Sciences

I am a sophomore in Biological Sciences at UC Irvine. My expected time of graduation is June 2015, and I plan on entering graduate school immediately after receiving my degree. I would like to continue research in cell and developmental biology, as it is such an interesting field full of new discoveries. For graduate school, I would like to attend UCSD, UCSF, or the University of Rochester, as these are all known for their excellence in research. Hopefully, after my graduate degree I could become involved in research for post-doctoral work. I would greatly rejoice if this position could take me to a faculty position. I know that a degree in biological sciences can open many doors and that pursuing a career in which my knowledge of biological systems could be required for development of treatments or diagnostics could also be a choice I could make.

Sarah Valles
Biological Sciences

I am a sophomore in Biological Sciences at UC Irvine. My expected time of graduation is June 2015, and I plan on entering graduate school immediately after receiving my degree. I would like to continue research in cell and developmental biology, as it is such an interesting field full of new discoveries. For graduate school, I would like to attend UCSD, UCSF, or the University of Rochester, as these are all known for their excellence in research. Hopefully, after my graduate degree I could become involved in research for post-doctoral work. I would greatly rejoice if this position could take me to a faculty position. I know that a degree in biological sciences can open many doors and that pursuing a career in which my knowledge of biological systems could be required for development of treatments or diagnostics could also be a choice I could make.

A person doesn’t really know who they are until they find their passions. I began college haphazardly majoring in biology and going through the motions. I was doing well in my courses but I couldn’t exactly see where I was taking myself. I told people I wanted to pursue medicine but I didn’t really mean it, not yet at least. Through my experiences as a CAMP mentor at UC Irvine, I have realized my passion in teaching. The word doctor comes from the Latin word ‘docre’ which means to teach. Being there for struggling students and seeing the grins on their faces after a successful exam has been extremely rewarding. I realized how much I love to teach and more importantly how much I enjoy serving others. From there I made serving the underserved community both inside and outside of the classroom my priority. In the future, I plan to attend medical school and pursue a masters in health policy. I want to affect change locally with my practice and nationally through powerful healthcare policies. With these goals in mind I hope to greatly impact the underserved and impoverished of America.
Reynal Palafox-Rosas: Future Doctor
UCSB Class of 2013

Reynal Palafox-Rosas is a senior who has participated in the CAMP program since Summer 2012. Her research mentor is Dr. Eileen Hamilton and her faculty PI is Eduardo Orias in the Molecular, Cellular, and Development Biology Department. She plans to graduate in March 2013 with a B.S. in Cell and Development Biology. Her plans are to continue to Medical School. Palafox-Rosas presented her research project, “The Sequence of a Genome Rearrangement Site on Micronuclear Chromosome1 of Tetrahymena Thermophila” at the 2013 CAMP Statewide Symposium in Irvine, CA and at the 2012 Southern California Conference for Undergraduate Research (SCCUR) in Camarillo, CA. The work was conducted at the Materials Research Laboratory.

In support of her career goal of becoming a doctor, Palafox-Rosas had participated in the 2010 Pre-medical Summer Program at the UCLA David Geffen School of Medicine. Additionally, she was an observer in psychophysics experiments in medical imagery at the UCSB Psychology Department.

Q&A WITH REYNAL PALAFAX-ROSAS

What Impact has research had on your undergraduate education?

Research has really helped me understand what it means to do science. Being in the lab has exposed me to the nature of science, what really is going on during an experiment, and what happens when experiments don’t go as expected. Research has complemented my major by allowing me to do the type of experiments we learn about in class, while also helping reinforce the material.

What is your current research project?

My research project is the sequencing of a region on a chromosome of the freshwater eukarote Tetrahymena thermophila. We believe that this region is involved in a special type of genome rearrangement so my job was to complete the sequence of this region so that this rearrangement mechanism can be better understood.

Have you decided on a career goal?

I want to become a doctor, so my goal is to go to medical school. I would like to do a specialty in internal medicine to focus on oncology later on. Because I also want to work in underserved areas, I am also considering family medicine as a possibility.

What do you enjoy most about research?

I really enjoyed working in the lab. My favorite part of research is doing the experiments. I love running gels and PCR reactions. Another thing I liked was being around my mentor, my PI, and the other lab members and realizing how lucky I was to be around such smart people. These are some of the brightest people in the field and you definitely try to learn as much as you can from them when you have an opportunity like this.

How has CAMP helped you advance in your field?

CAMP got my research career started. Before CAMP, I did not really know how to get started with the research process. The program helped me find a lab that matched my interests. CAMP also helped me develop my communication skills by giving me the opportunity to present at the statewide symposium and other conferences. Additionally, CAMP has provided me with networking opportunities, which can be very helpful especially if you are planning on applying to graduate or professional school.
Christian Perez: Future Chemical Engineer  
UCSB Class of 2015

Christian Perez is a sophomore Chemical Engineering student who has participated in the CAMP program since Spring 2012. His research mentor is Stephanie Mendes (UCSB BD Fellow) and his Faculty PI is David Valentine in the Earth Sciences Department. He plans to graduate in June 2015 with a B.S. in Chemical Engineering. His plans are to continue research and pursue a Ph.D.

Perez presented his research, “Potential for Microbial Consumption of Marine Hydrocarbons,” at the 2013 CAMP Statewide Symposium and at the 2012 UCSB-CAMP summer research symposium. Additionally he presented a poster at SACNAS 2012 National Conference in Seattle, Washington. He is building strong credentials in student leadership—he is an officer in Los Ingenieros, a Latino engineering organization, as well as for competitive admission to graduate education.

UC Santa Barbara Celebrates Outstanding Faculty Mentor: Professor Eduardo Orias

Eduardo Orias is a Research Professor Emeritus at UCSB and is a strong supporter of undergraduate research and the UCSB CAMP program. Orias joined the faculty at UCSB in July 1959 and taught genetics, his specialty. He became research professor emeritus in 1994, starting a “second career” in genomics. Orias has worked with the protozoan Tetrahymena for over 50 years, contributing new knowledge in its genetic, genomic, molecular, cellular, and developmental biology. In addition to the many Ph.D. students who earned their degrees working in his lab, more than 100 UCSB undergraduates, including more than 12 CAMP-supported undergraduates, have done original research in his lab since Orias took retirement. In 2007, he received the UCSB Chancellor’s Award for Excellence in Undergraduate Research Mentorship. The UCSB CAMP program is very blessed to have such a wonderful supporter and mentor.

(See also UCLA Spotlight on Assistant Professor Jorge Torres (UCSB alumnus), who was also mentored by Dr. Eduardo Orias, page 34.)

Thank you, Dr. Orias! You supported more than 100 undergraduates to conduct original research in your lab beginning 1959.
Maia Kinnebrew is a biology major in the College of Creative Studies at UCSB. She has gained a wealth of experience through her research and professional development experiences such as field assistant with Black Rock Geosciences in several California locations. During these projects, she collected soil, soil gas and groundwater samples during a “subsurface investigation” in areas near school campuses. She also had gone to the Panama Canal Zone to work “in the trenches,” to expose the Pedro Miguel fault and help map a portion of the fault line.

Kinnebrew is currently an undergraduate researcher in the Han Laboratory. She will present her project, “Oligomerization and its effect on the function of 7-transmembrane proteins” at the Gordon Research Conference on Proteins in New Hampshire, June 2013. This is another step forward for Kinnebrew, who presented this project in the “Works-in-Progress” poster session at the 2013 CAMP Statewide Symposium. Additionally, she will present at the 2013 Biophysical 57th National Conference in Philadelphia, and has already added to her resume SACNAS 2012 in Seattle (where she won best poster award), and 2012 SSCUR Conference, California State University, Channel Islands.

Besides her academic endeavors, Kinnebrew is interested in speech and debate – she was a state championship competitor in 2010 – and is a 2nd Degree Black Belt in TaekwonDo. She also participates in various outreach events for girls, such as the Materials Research Lab’s Isla Vista Youth Project. She was selected for the Arnold and Mabel Beckman Foundation’s Beckman Scholars Program.

Q&A WITH MAIA KINNEBREW

What impact has research had on your undergraduate education?

Research has been the most memorable part of my undergraduate education, and has given me inspiration to achieve both in the lab and in my classes. Research has helped me meet mentors who have given me the courage to take big steps in my undergraduate education, and through research I have learned what I will need in order to accomplish my goals for the future.

What is your current research project?

I am studying the structural and functional characteristics of Proteorhodopsin, a 7-transmembrane protein from marine bacteria. This protein forms oligomeric complexes, making large hexamers in vivo and we are elucidating the functional differences between the hexamers and monomers. We hope our current research could lead insight to other more complex mammalian 7-transmembrane proteins such as the G Protein Coupled Receptors.

Have you decided on a career goal?

I hope to go to graduate school, and then make my way to a faculty position at a university where I can continue to do research.

What do you enjoy most about research?

I enjoy the team problem solving and the mentorship that comes from graduate students and professors. I also enjoy presenting at conferences and getting feedback.

How has CAMP and other research programs helped you advance in your field?

CAMP helped me improve my writing and presenting skills by requiring written reports and by hosting small symposia where CAMP students give oral presentations to their peers. The CAMP Statewide event was also a great and inspiring way for me to experience a big conference for the first time. My experiences in CAMP encouraged me to apply for another scholarship at UCSB, the Beckman Scholarship, which I was awarded in summer 2012. This is a 15-month long scholarship that is designed to develop undergraduate researchers both scientifically and personally. Most memorably, the Beckman Scholars program enabled me to invite a professor of my choice to give a talk. I invited Linda Columbus [Assistant Professor of Molecular Biology and Biological Physics, University of Virginia] and was able to find funding for her to fly from Virginia and give two talks at UCSB. The first was on her research, and later that night she presented to both graduates and undergraduates on the art of “Teaching Science like we do Science.” Through these experiences, I have further realized my passion for science, research and teaching.
ASPIRING SCIENTISTS EARN DISTINCTIONS

UC Berkeley

UC Berkeley Marine Biologist Conducts Research in Italy

JESSICA HERNANDEZ
Double Major in Marine Science and Italian Studies
Expected Graduation: August 2013
Graduate School Interest: Marine Science

Hernandez, 5th Year Senior at UCB, already has built a resume that includes exciting research experiences in Italy and Ecuador as well as on the Berkeley campus.

With her final semesters of her undergraduate career on the near horizon, Hernandez decided to try and merge her two majors, Marine Science and Italian Studies.

In Summer 2012, with support from CAMP, Women in Science and Engineering, and a Charles Ramsden grant, she conducted research in marine sanctuaries at the University of Salento, Lecce, Italy, in the Department of Marine Biology and Zoology. Her advisor was Dr. Ferdinando Boero, Professor of Zoology, University of

Hernandez continues on next page.

UCB Student Takes Top Award at Osaka, Japan Symposium

CAMille MARTINEZ
Material Science Major
Expected Graduation: May 2014
Graduate School Interest: Material Sciences

In 2011 Martinez attended a Texas NSF summer research program and then traveled to Osaka, Japan for the Osaka University Joint-TeraNano 2011 International Symposium, took the top poster award for “Sample Preparation for Stable and Enhanced Photoluminescence of Single-walled Carbon Nanotubes.” Only eight total awards were presented among undergraduate, graduate, and post-doctoral entries. She was fully funded by NSF Nanl-Japan PIRE grant to attend the conference.

Summer 2012 placed Martinez at MIT doing material science research under faculty advisor Professor Donald Sadoway and mentored by NERD CAMP Alumnus Salvador Barriga. MIT is her first choice for graduate school.

She is mentored by Xioranny Linares, Material Science graduate student and NERD CAMP Alumna.

Martinez is a member of UC Berkeley Women in Science & Engineering (WiSE), and serves as the professional liaison for UC Berkeley’s Materials Science and Engineering Association. In addition to excelling in academics, Martinez is also athletic: she is a Shotokan Karate Second Degree Black Belt, having trained for 15 years. Her special interest in this area is self-defense classes for women.
Jessica Hernandez continued

Salento, who has special interest in marine biodiversity and ecosystem functioning. (See Q&A below regarding this experience)

Recently, Hernandez received Honorable Mention for her work on, “Cultivation Technique for Clytia Hummelinki,” at the 2013 CAMP Statewide Undergraduate Research Symposium. She has been working under UCB Professor M.A.R. Koehl, Ecological and Evolutionary Biology.

Hernandez previously had an internship at the Global Student Embassy, Bahia de Caraquez, Ecuador, for a month, from December 2011 - January 2012, working on the deforestation problems of coastal Ecuador.

In addition to her coursework and research activities, she has served as a K-12 outreach facilitator at Lawrence Hall of Science, sharing her love of science with youngsters.

She is very enthusiastic about her major and her future role in marine science: “I have a strong connection with the ‘water people’ and the ocean as it has been my door to a better understanding of the world.”

Her advice for anyone considering majoring in marine science/oceanography? “Choose this field if you are passionate. This field is magical!”

Q&A WITH JESSICA HERNANDEZ

What are your post graduation plans?
I am interested in getting more involved with my tribe in Coatzacoalcos, Veracruz (Mayan). As of now, I have a position at John Hopkins Marine Station at Stanford University to work with Dr. Larry Crowder. The main focus of my research will be small scale marine fisheries. I will also be learning more about the biology and conservation as well as policy and management behind small scale marine fisheries. Small scale fisheries is a scientific term to refer to fishing communities – mostly in developing countries - having fish species that are in small numbers. Unlike big scale fisheries, there is no governmental help to preserve and conserve these fisheries.

Comment on your international experience on the coast of Italy – how you made it happen.
I knew it would be a challenge, but after getting the support to fundraise and layer funding I made my dream of doing research in Italy a reality. I considered three different professors and applied to their programs. After being accepted to all three, I decided to work with Dr. Boero because he was at one point a scientist at UC Berkeley when it still had the marine lab. He is a hydrozoan taxonomist, a leader in his field. Working with Dr. Boero was an honor … he guided me through scientific papers as well as instructions to how to complete my project. I felt like a graduate student in his lab, a wonderful feeling for an undergraduate.

How long have you been diving?
I have been diving ever since I was a child. My mother’s tribe is located on the coast of Mexico and my father was a fisherman in his homeland, El Salvador. Fishing communities have always been in my family and this is what inspires me to help them.

Who inspires you?
There are many individuals who inspire me. To name a few, my father, mother and my CAMP director. My father came to this country during war times as a child and through his journey in Mexico he met my mother. They both fished for their families. My CAMP director, Diana Lizarraga inspires me through her kindness and dedication. Coming to a university like UC Berkeley made me a frightened student. It wasn’t until I found Cal NERDS and NSF CAMP that I finally felt at home. Through this involvement, I came to join AISES and become its president.

Tell us about your undergraduate experience:
Coming here as the top student in my high school [Valedictorian, Animo South L.A. Charter High School] gave me the confidence to tackle classes, but it was a cultural shock. Thanks to the support in research and for graduate school [from] CAL NERDS/NSF CAMP I can proudly say I have had a great undergraduate experience.

Ultimate career goal?
My ultimate career goal is to obtain a Ph.D. that will not only allow me to expand my knowledge in oceanography, but also grant me the necessary tools to help tribes who depend on marine ecosystems for survival and rituals. Establishing a non-profit and managing it to help indigenous people strive for a better future and help them with the conservation of their marine ecosystems and coastal lands is my long-term goal after I become the first in my family to obtain a Ph.D.
ADRIAN QUIROZ  
Civil & Environmental Engineering  
Home town: Santa Paula, CA  
Graduate School Interests: Transportation Engineering, Civil Systems, Operations Research  
“Participating in the summer research program allowed me to see how research was undertaken, and the rigor that comes with it. Yet, what I never expected was the excitement and thrill generated by the ability to test and analyze your own work based on your own ideas.”

ALAN MENDOZA  
Nuclear Engineering  
Home town: Oxnard, CA  
Graduate School Interests: Green energy  
“Being part of CAMP has helped me learn about graduate studies. It has proven to be an invaluable resource.”

ANDRES VINDAS MELENDEZ  
Mathematics & Philosophy  
Home town: Lynwood, CA  
Graduate School Interests: Mathematics Education, Mathematical Logic, & Philosophy of Mathematics  
“As a CAMP Scholar I have become more aware of issues that researchers, instructors, and students face in the area of Mathematics Education.”

ANDREW EKELEM*  
Bioengineering  
Home town: Walnut, CA  
Graduate School Interests: Robotics, Neuroscience  
“My future goals are to make devices that improve the rehabilitation process for people who suffer from neurotrauma, such as spinal cord injury (SCI) or traumatic brain injury (TBI). As a CAMP scholar, I have gained research experience with mentors who are paving the way for new treatments and rehabilitation equipment.”

*Ekelem has received a full fellowship at Vanderbilt University, starting the Ph.D. in Fall 2013.

AREIDY ARACELY BELTRAN  
Earth & Planetary Science  
Home town: Moreno Valley, CA  
Graduate School Interests: Environmental Sciences, Engineering, Environmental Energy Technologies  
“It is very comforting walking into the NERDS center and seeing people like you struggling together to get through difficult STEM courses and pushing each other to succeed.”

DIANA ROSENDO  
Applied Mathematics & Chicano Studies  
Home town: Stockton, CA  
Graduate School Interests: Masters Degree: Mathematical Biology; Ph.D.: Mathematics Education  
“I hope to pursue an Applied Mathematics Masters program so that I can teach in community colleges that are so crucial to all communities. Then I hope to pursue the Ph.D. and focus on spreading this culture of equity in the sciences and mathematics just as CAMP/NERDS has done so successfully.”

CalNERDS continues next page.
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<th>Name</th>
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<th>Home Town</th>
<th>Graduate School Interests</th>
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<tbody>
<tr>
<td>Emmanuel Flores</td>
<td>Civil &amp; Environmental Engineering</td>
<td>Montclair, CA</td>
<td>Graduate School Interest: Structural Engineering “My future goal is to continue my participation in various research opportunities to strengthen my experience. I plan to apply to graduate school in the field of civil engineering and focus specifically in the subfield of structural engineering where I hope to attain my Ph.D.”</td>
</tr>
<tr>
<td>Gerard Leyva</td>
<td>Physics</td>
<td>Long Beach, CA</td>
<td>Graduate School Interests: Nanotube research or quantum computing “CAMP-NERDS made it possible for me to do research in Summer 2012. With their excellent help and guidance, I found a spot to do boron nitride nanotube research with Dr. Alex Zettl, who leads an experimental solid state physics research group at UCB, for the summer.”</td>
</tr>
<tr>
<td>Jose Avina</td>
<td>Geophysics</td>
<td>Wilmington, CA</td>
<td>Graduate School Interests: Water Quality/Resources in Environmental Engineering “Being in CAMP has opened academic doors that I did not realize existed. Doing research during summer and continuing throughout the year has reassured me that Environmental Engineering is the field where I will pursue a graduate degree and my professional career.”</td>
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UC Berkeley Physics Major Takes First Place Poster at AISES 2012 Conference in Alaska

Maryrose Barrios
B.A. Physics, May 2013
Graduate School Interest: Atomic, Molecular, and Optical (AMO) Physics

Physics major Maryrose Barrios is a busy graduating senior, making graduate school visits and deciding where she will enroll for her doctoral work. Her undergraduate record is an inspiring as it is impressive, and she has maintained a rich perspective on her academic, social, cultural and professional development. Her minor is in Slavic Literature, to give some idea of her diverse interests.

Barrios took first place for her atomic physics research poster at the November 2012 AISES Conference held in Anchorage, Alaska, and won Special Merit in Research for her work “A 2D-MOT as a Source of Cold Rubidium Atoms,” at the 2013 CAMP Statewide Research Symposium.

Barrios engaged in important work at Lawrence Berkeley Laboratory focused on a large historic ethnographic data project from the Phoebe Hearst Museum. For two full summers she catalogued, prepared, scanned, analyzed and filtered more than 60 unique ethnographic recordings of California Indian songs and dances. Her work helped to preserve this collection for future scholars. She utilized extensive image analysis and audio filtering throughout the project, with a goal of restoring and obtaining audio from a 3D cylinder scanning process.

A member of the CAMP-NSF/NERDS Physics Team for 2011-12, Barrios was also president of the AISES student chapter in 2010-12, and academic chair of the Native American Recruitment and Retention Center in 2011. She was a speaker at the Native American Language Revitalization Forums on the Stanford campus in 2012, among other special interests and activities.
Q&A WITH MARYROSE BARRIOS

Do you have plans for graduate school?

Currently, I have applied to several graduate PhD programs for Physics and am in the process of hearing back now. As of now, I have one offer from Harvard that I am considering for Fall 2014.

Your ultimate career goal?

At this point in my career, I find both research and teaching very rewarding. This makes obtaining a professorship ideal for me, as I would have the capacity and position to do both, as well as have the opportunity to develop and give back some of the knowledge and experiences I’ve received from my mentors.

What is your special area of interest in the field of physics?

My current research lies in the field of AMO (atomic, molecular, and optical) physics. This field is very exciting to me as a researcher as it has the versatility to address many fundamental questions found within other branches of physics and science, such as those within condensed matter, biology, particle physics and quantum computing.

Who and what inspires you?

I think that a lot of my inspiration has ultimately stemmed from passion and people who were passionate. I had a high school physics teacher who first got me interested in physics, because he was passionate about students understanding and engaging in science. I had parents who despite never going to college themselves, were also passionate about making sure my brother and I would pursue higher education and strive to live with purpose. Moreover, I was able to find mentors who were willing to let me express my own interests by contributing to their lab. As a bonus, I get to help and encourage others, which makes it even more rewarding.

What did you enjoy most about being in AISES leadership?

One of the great things about being a part of AISES was the opportunity for me to help other Native students get excited about the role their education could play in affecting the world and their communities. It was also very exciting to be a part of creating an atmosphere where people can come together and help each other achieve their goals and be a resource to one another.

Can you comment on your experience as a research assistant at Lawrence Berkeley Lab?

I really enjoyed working at LBL. Though my job there at the time was not a traditional physics project, working at a huge, national laboratory really gave me a lot of perspective and excitement about what a career in research could look like as I worked alongside professionals from, literally, all over the world. My first project blended my Native American experiences with the new experiences I was gaining doing physics research. It made me feel that I had a place in the field and gave me a lot of confidence.

Tell us about your overall undergraduate experience at Berkeley.

Berkeley has been a great school for me in many ways. As a first-generation college student, I was very hesitant to go too far from home for college, so I only applied to UC’s within California. Fortunately for me, I got into Berkeley and decided to go, which besides being somewhat close to my home, was also a top-notch research institution. Throughout my development as a student, this ability to participate in hands-on research has allowed me to see a larger purpose and application for the knowledge I was acquiring in the classroom.

“CAMP has offered me new experiences that have better prepared me for the path to and through grad school. I have gained invaluable skills and confidence to pursue my dream of getting my PhD and, hopefully, obtaining a research professorship at a university.”

—Maryrose Barrios, UC Berkeley Class of 2013
Salvador Ramirez II
UCR Class of 2013

Salvador Ramirez II will complete a B.S. in Environmental Science, with a concentration in environmental toxicology in June 2013. He has been conducting undergraduate research in the Department of Botany and Plant Sciences since 2009. In Dr. Gordon Love’s laboratory, Ramirez “was better able to understand the stable chemical composition of the environment and the organisms present during the mid-Proterozoic era.” He analyzed biomarkers using an MRM GC-MS (monitoring gas chromatography-mass spectrometer). In Dr. Sean Cutler’s laboratory, he worked on the mechanisms and receptors involved in the “abscisic acid signal transduction pathway.” He focused on analyzing transgenic Arabidopsis thaliana plants.

Ramirez won a Special Merit in Research Award for his project, “Abscisic Acid Signal Transduction Analysis through Agrobacterium Biotransformation” at the 2013 CAMP Statewide Research Symposium. In 2012, he won Honorable Mention at the 2012 CAMP Statewide Symposium for earlier work on the same project.

He served as President and Treasurer of the CAMP Student Organization at UCR from 2010 to 2013.

Erika Galvez
UCR Class of 2013

Erika Galvez, B.S. Bioengineering, looks forward to an exciting future. She has worked as a laboratory assistant at the University of California Nematology Department.

Galvez won Special Merit in Research at the 2013 CAMP Statewide Symposium. She conducted research in the Department of Bioengineering, working on a project to improve the laparoscopic surgical procedure for prostate cancer patients. She has enjoyed a vibrant undergraduate career. As a CAMP member, she participated in outreach activities and public speaking events. She was a member of Biomedical Engineering Society/Engineers Without Borders. She volunteered for PACE: Parents for Academic Challenge and Enrichment, which held events welcoming newly enrolled students and their families to campus. Galvez, who is fluent in Spanish, made important contributions to outreach events on campus. In other volunteer engagement, she led Boy Scout groups in a geocaching activity and taught them to use a GPS navigator.

Christopher Galley
UCR Class of 2014

Christopher Galley is pursuing a B.S. in Biology, and holds a 3.9 gpa. He was a transfer student from Chaffey College, Rancho Cucamonga, California, where he conducted research in wildlife monitoring and ecology. He began conducting

CAMP 2013 Proceedings and Profiles
research at UCR during summer 2012, working on plant leaf development. At the 2013 CAMP Statewide Research Symposium he presented “Identifying Proteins that Interact with Lateral Organ Fusion1 in Arabidopsis Thaliana,” earning Honorable Mention.

An engaged student on campus and in the community, Galley volunteers at Riverside Community Hospital, assisting with direct and indirect patient care. He is a church youth leader at the Rialto Seventh-Day Adventist Church, where he plans community service events and church activities. Additionally, he has served as an intern at the Rancho Santa Ana Botanic Garden, Claremont, California, where he engaged in plant conservation, mapping and field collection as well as contributing to the plant specimens database.

Galley is a member of Tau Sigma National Honor Society, Phi Theta Kappa Honor Society, and is on the Dean's Honor List. At Chaffey College Galley received the Exemplary Achievement Award for his 4.0 GPA for two semesters, and won the President’s Award for Educational Excellence, among others.

INTRODUCING

Maria Franco-Aguilar, UCR CAMP Coordinator

Maria Franco-Aguilar has served the University of California, Riverside since 1987 in a variety of positions. Since 1990 she has provided guidance and support to undergraduate and graduate students who participate in various outreach programs, especially underrepresented students in the STEM fields. She conducts outreach activities at both state and national level and serves on several educational leadership committees designed to increase the pipeline of underrepresented students in higher education and the UC system, in particular. Franco-Aguilar is Director, Academic Preparation & Outreach, in the UCR Graduate Division. Her academic degrees are in Administration of Justice and Sociology.
Community College Transfer Success
Alfredo Perez, Future Ph.D., Conducted Research in Germany

In 2011 Alfredo Perez transferred to UC San Diego from Southwestern College with an Associate in Science degree in physics. He is a chemistry major with special interest in chemical synthesis, computational chemistry, and De Novo Protein Design.

As a community college student, he won the Student of Distinction Award and was awarded a Hites Transfer Scholarship from the Phi Theta Kappa Honor Society, a distinction held by just 10 community college transfer students in the nation.

Prior to his first quarter at UCSD, he experienced summer research in Germany, at the Technische Universitat Hamburg-Harburg. Under Professor Irina Smirnova at the Institute of Chemical Engineering, Perez worked on an extraction system for the purification of specially-engineered enzymes. Having this extraordinary experience on his resume, he began his career at UCSD.

Perez won a Special Merit in Research Award at the 2012 CAMP Statewide Undergraduate Research Symposium for his project, Metal-Mediated Multi-protein Structures for Ester Hydrolysis, under the guidance of Professor F. Akif Tezcan, Department of Chemistry and Biochemistry.

In 2012-13, Perez received support from the MARC program (Minority Access to Research Careers, NIH) to further his professional development.

He is a member of the American Chemical Society, and presented his research at the ACS National meeting in March 2012. Additionally, he presented at the SACNAS 2010 National Conference and at ABRCMS 2011.

Perez expects to graduate in December 2013. He plans to earn a Ph.D. in chemistry and become a chemical researcher in industry or academia.

Q&A WITH ALFREDO PEREZ

Why do you enjoy conducting research?
I enjoy doing research because of the problem solving that comes along with the project. I also like the fact that the daily tasks change often and there is always necessary to learn something new to make progress within the project.

What memories remain after your experience in Germany?
I had such a great time living in Germany for the summer. I think that living where it was not as easy to communicate with others allowed me to learn a lot about myself. It was also a cool opportunity to meet many people from different places around the world.

What do you like best about UCSD?
UCSD is a great research institution with a lot of opportunities for undergraduate research. Any student that wants to participate in a research project should be able to find a good fit. There are advisors that can help find a research group; the writing center helps students write professional emails, CVs, personal statements, etc.

Best advice for a new transfer student at UCSD?
I think it is important to not underestimate how different a quarter system can feel in comparison to a semester system and that it is important not to fall behind with coursework.
Congratulations to Our New PhDs!
Alan Gomez, Bioengineer
UCSD Class of 2013

Alan Gomez is a member of the UC San Diego Class of 2013, completing a B.S. degree in Bioengineering. His career plans include directing projects in R&D in industry. He plans to work in an engineering position for a year before applying for a doctoral program. Gomez’s special area of interest is in bionanotechnology. He has set his goals on developing nanoscale medical devices for diagnostics and treatments of disease, such as DNA nanotechnology and nanosensors.

He worked as a research assistant in the Nano Sensors and Devices Lab in the Bioengineering Department. He will soon be a published first co-author.

“Being able to investigate or come up with something that no one has ever done before is an awesome feeling,” Gomez says. He adds, “I really enjoy being able to pursue my own ideas and interests to producing something that I can call my own.”

Part of his lab duties included training a group of underclassmen in proper laboratory protocols and use of equipment. He also served as a teaching assistant for an introduction to bioengineering discussion section for 30 incoming freshmen and transfer students.

His senior design project focused on the design and construction of a pathology tool to section human eyes to specific parameters. With his team, he translated the design solutions into detailed SolidWorks models for machine shop fabrication and tested the prototype. Gomez, who won Provost Honors for 2011-12, won Special Merit in Research at the 2013 CAMP Statewide Undergraduate Research Symposium (see page 15).

He is inspired by his mom, “because as a single mom she has worked really hard to help me get where I am.”
Amanuel Zeryihun
UCSC Class of 2013

Amanuel Zeryihun is a graduating fourth year senior studying electrical engineering at the University of California, Santa Cruz. Amanuel’s passion for working in the community and commitment to improving diversity in the settings around him have been a very visible component of his sojourn at UCSC. Along with his participation in CAMP, Amanuel served through multiple positions in the National Society of Black Engineers chapter at UCSC, most notably as chapter co-founder, Vice President and President. He also served his community as a Residential Advisor for two years.

In his second summer at UCSC, Amanuel worked in the NASA Ames Advanced Studies Laboratory with professor Nobby Kobayashi where he developed a prototype for a thermoelectric characterization system for nanoscale semiconductors. Amanuel’s involvement in research continued to a different branch of electrical engineering as he now conducts research under professor Hamid Sadjapour in the field of communications and network coding. Amanuel first developed an interest in wireless systems when working on a project in Intel’s smartphone development group this past summer. His work consisted of testing the modems of developing mobile devices so that the devices could be ready to pass certification and enter the market. Through his position at Intel, Amanuel gained excellent insight as to the industrial component of engineering and how important it is for one to pursue an advanced degree in order to be attain highly sought out and competitive research and development positions. For this reason, Amanuel successfully sought and secured a fellowship from the National Gem Consortium to study for a thesis based Masters starting Fall 2013 at the Georgia Institute of Technology in Electrical and Computer Engineering. He will be studying in one of Georgia Tech’s distinguished abroad programs, Georgia Tech Lorraine, which is located in the eastern region of France, Lorraine in the city of Metz.

“To be able to study for my Masters and have the option of continuing for my Ph.D., while studying at one of the top universities and research institutes in the world—and to be able to do so in a new country—will be an unbelievably thrilling experience. I am so grateful to have had the mentorship, experiences and exposures that I had with the CAMP research program... they allowed me to really get a grasp for what my fields have to offer and how exactly I could make each opportunity a success.”
The University of California

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