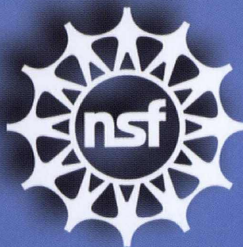


UNIVERSITY OF CALIFORNIA

# CAMP



LOUIS STOKES ALLIANCE  
FOR MINORITY PARTICIPATION

## 2008 SYMPOSIUM PROCEEDINGS & PROFILES

Berkeley

Davis

Irvine

Los Angeles

Riverside

San Diego

Santa Barbara

Santa Cruz

UNIVERSITY OF CALIFORNIA



## UNIVERSITY OF CALIFORNIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

UC CAMPUS SITE DIRECTORY  
UNIVERSITY OF CALIFORNIA  
Mark G. Yudof, President

### UC BERKELEY

GEORGE C. JOHNSON, PH.D.  
**FACULTY DIRECTOR**  
Professor, Mechanical Engineering  
gjohnson@me.berkeley.edu

DIANA LIZARRAGA, M.A.  
CAMP COORDINATOR  
Phone: 510 643-8978  
Fax: 510 642-0199  
ladiana@berkeley.edu

### UC DAVIS

GARY E. FORD, PH.D.  
**FACULTY DIRECTOR**  
Associate Vice Provost  
Undergraduate Studies  
College of Engineering  
geford@ucdavis.edu

GAIL MARTINEZ, PH.D.  
CAMP COORDINATOR  
Assistant Vice Provost,  
Undergraduate Studies, Offices  
of the Chancellor and Provost  
UC Davis, CA 95616-5294  
Phone: 530-752-9710  
Fax: 530-752-6359  
gamartinez@ucdavis.edu

### UC LOS ANGELES

RICHARD L. WEISS, PH.D.  
**FACULTY DIRECTOR**  
Department of Chemistry  
& Biochemistry  
weiss@chem.ucla.edu

FRANK NEVAREZ  
CAMP COORDINATOR  
UCLA  
3077A Young Hall  
UCLA Box 951569  
Los Angeles, CA 90095-1569  
Phone: 310-206-4600  
Fax: 310-267-2219  
frankn@lifesci.ucla.edu

### UC SANTA CRUZ

A. RUSSELL FLEGAL, PH.D.  
**FACULTY DIRECTOR**  
Division of Natural Sciences  
flegal@etox.ucsc.edu

MALIKA BELL, M.S.  
CAMP COORDINATOR  
Phone: 831-459-3761  
Fax: 831-459-2884  
malika@biology.ucsc.edu

### UC IRVINE

DEREK DUNN-RANKIN, PH.D.  
**FACULTY DIRECTOR**  
Department of Mechanical &  
Aerospace Engineering  
ddunnran@uci.edu

KIKA FRIEND, M.A.  
CAMP COORDINATOR  
Phone: 949-824-2363  
Fax: 949-824-2634  
kika@uci.edu

### UC RIVERSIDE

MICHAEL J. MARSELLA, PH.D.  
**FACULTY DIRECTOR**  
Department of Chemistry  
michael.marsella@ucr.edu

CHRISTOPHER OLIVERA, PH.D.  
CAMP COORDINATOR  
Academic Advising Center  
College of Natural and Agricultural  
Sciences  
UC Riverside  
900 University Ave.  
Riverside, CA 92521-0210  
Phone: 951-827-5326  
Fax: 951-827-4543  
christopher.olivera@ucr.edu

### UC SANTA BARBARA

GLENN E. BELTZ, PH.D.  
**FACULTY DIRECTOR**  
Associate Dean for Academic Affairs,  
College of Engineering

DOROTHY PAK, PH.D.  
CAMP CO-COORDINATOR  
Material Research Laboratory  
Phone: 805-893-5314  
Fax: 805-893-5027  
pak@mrl.ucsb.edu

JULIE STANDISH, PH.D.  
CAMP CO-COORDINATOR  
Material Research Laboratory  
Phone: 805-893-5314  
Fax: 805-893-5027  
standish@lifesci.ucsb.edu

### UC SAN DIEGO

DAVID M. ARTIS, PH.D.  
**PROGRAM DIRECTOR**  
Academic Enrichment Programs  
Student Center Bldg. B  
dartis@ucsd.edu

JACQUELINE AZIZE-BREWER, PH.D.  
CAMP COORDINATOR  
Phone: 858-534-8839  
Fax: 858-534-8895  
jazize@ucsd.edu

CAMP STATEWIDE  
University of California, Irvine  
serves as lead campus and  
administrative center for  
California LSAMP.

MICHAEL V. DRAKE, M.D.  
Chancellor  
Principal Investigator

DEBRA J. RICHARDSON, PH.D.  
Dean, Donald Bren School of Information  
and Computer Science  
Co-Principal Investigator

DEREK DUNN-RANKIN, PH.D.  
Professor, Mechanical and  
Aerospace Engineering  
Co-Project Director

MARJORIE DEMARTINO, M.E.A.  
Co-Project Director  
Proceedings & Profiles Editor  
949-824-4813  
dmartino@uci.edu

SILVIA SWIGERT, M.S.  
California LSAMP Evaluator  
Director, Research and Evaluation,  
Center For Educational Partnerships  
949-824-0201  
sswigert@uci.edu

MIKE JENKINS  
Technical Support  
949-824-3780  
mjenkins@uci.edu

SANTANA RUIZ, M.A.  
Community College Outreach  
949-824-1015  
ruiz@uci.edu



UNIVERSITY OF CALIFORNIA  
**CAMP**  
LOUIS STOKES ALLIANCE  
FOR MINORITY PARTICIPATION

CAMP Statewide Office  
Center For Educational Partnerships  
5171 California Avenue, Suite 150  
Irvine, CA 92697-2505  
949-824-6578 • 949-824-3048 (fax)  
camp@uci.edu  
www.california-lsamp.uci.edu

CAMP is one of 38 Louis Stokes  
Alliances for Minority Participation  
funded by The National Science  
Foundation; A. James Hicks, Ph.D.,  
LSAMP Director

This publication is based upon work supported by the  
National Science Foundation under Grant  
#0603239. Any opinions, findings, and conclusions  
or recommendations expressed herein are those of  
the CAMP leadership and participants and do not  
necessarily reflect the views of NSF.

[www.california-lsamp.uci.edu](http://www.california-lsamp.uci.edu)

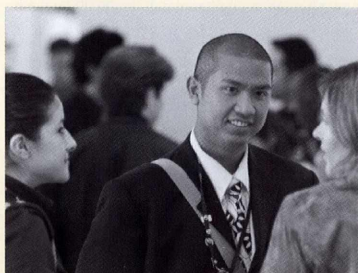
UNIVERSITY OF CALIFORNIA  
**CAMP**

LOUIS STOKES ALLIANCE  
 FOR MINORITY PARTICIPATION

A Grant Through the National Science Foundation

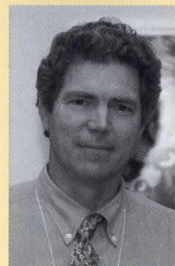


# 2008 STATEWIDE SYMPOSIUM PROCEEDINGS & PROFILES



## WELCOME

We are pleased to present the annual publication of highlights and profiles from our UC Statewide Symposium. By participating in this event, students test their understanding and move forward in subject mastery. Every great goal is achieved by taking small steps each day. We hope that our UC students' steps to experience research lead to greater appreciation for the wonders of science and engineering. The statewide 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 symposium is a gateway to other venues of scientific discourse. Enjoy the profiles!



—Marjorie DeMartino, M.F.A.,  
 Symposium Chair,  
 California LSAMP Co-Project Director

—Derek Dunn-Rankin, Ph.D.,  
 Professor Mechanical & Aerospace Engineering,  
 California LSAMP Co-Project Director

## Table of Contents

- 2 General Information about CAMP
- 5 UC Irvine's Dean of Engineering, Rafael Bras
- 6 Symposium Presenters and Awardees
- 8 Award Winning Research
- 16 Symposium Judges
- 18 CAMP Spotlights, Profiles, News
- 39 Corporate Support

# CAMP General Information

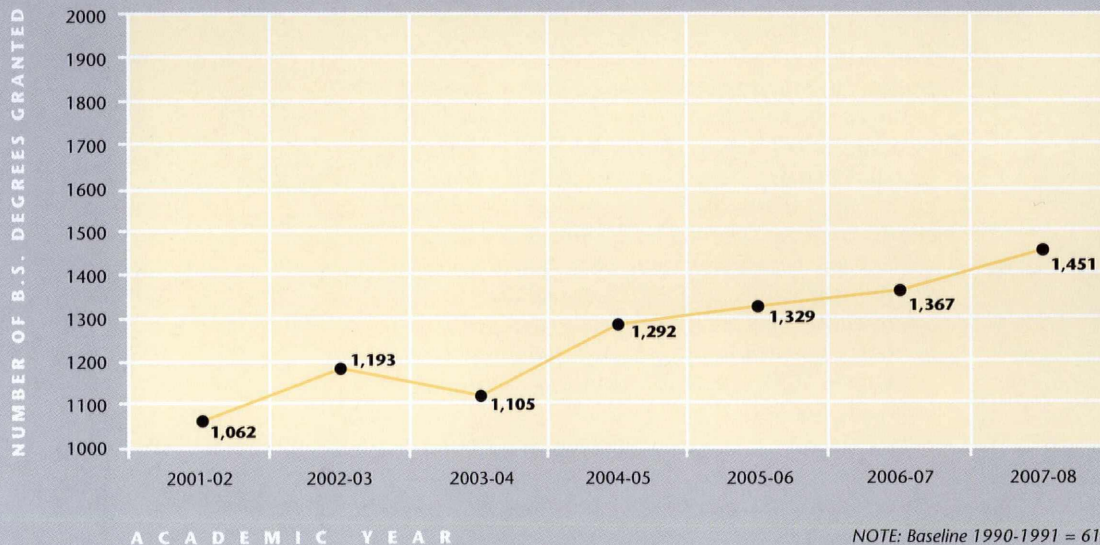
## Summary

The University of California LSAMP is a senior Louis Stokes Alliance for Minority Participation in Phase IV (2006-2011), continuing a cooperative agreement between the National Science Foundation and UC Irvine, the lead campus and administrative center since 1991. The UC-LSAMP represents a sustained investment by the University and the National Science Foundation. Institutional and faculty support as well as collaborative relationships and student services distinguish the program. Minority students are offered development opportunities and hands-on experiences that increase retention, academic excellence, and degree completion. The primary goals are to significantly increase the number of baccalaureate degrees granted to underrepresented students in science, technology, engineering, mathematics (STEM) at the University of California, and support continuation to graduate studies, particularly for the Ph.D.. The Alliance facilitates a systemwide network of faculty, program staff and students contributing to a shared vision of student academic attainment and measurable outcomes, both quantitative and qualitative. Our goals include preparing the future generation of scientists and engineers who will not only diversify the professional workplace but enhance the economic health of our state and nation.

## Program Impact

For 17 years, the Louis Stokes California Alliance for Minority Participation has pursued a comprehensive approach to support underrepresented students to complete B.S. degrees in STEM and prepare for graduate education. UC STEM baccalaureate degrees granted to underrepresented students increased by 136% since 1991, including the latest report for 2008. STEM enrollment increased by 103% through 2007. The effort has been unwavering and demonstrates the effectiveness of one-on-one mentoring in retention efforts. CAMP participants are award-winning researchers and have co-authored published papers in refereed journals while still undergraduates. Student academic performance is a top indicator of retention in STEM majors, and is perhaps most visible in research presentations. University of California students consistently earn recognition at national scientific meetings. The graduate school culture has made significant increases in students completing master's and doctorate degrees, supported by the NSF Bridge to the Doctorate activity and connectivity to AGEP. At a minimum, 35% of program participants have gone on to graduate or professional schools. They are also taking their places as faculty in UC, CSU, and four-year institutions outside California.

UNIVERSITY OF CALIFORNIA SYSTEMWIDE  
TREND IN STEM MINORITY B.S. DEGREES GRANTED (2001-2008)



## SYSTEMWIDE CORE PRINCIPLES & ACTIVITIES

- **Power of Mentoring:** involvement in faculty mentored research and internships
- **Power of Performance:** presenting research at campus, statewide, & national venues; developing communication skills
- **Sphere of Influence:** fostering a sense of shared purpose and identity through study groups and networking
- **“Good” Peer Pressure:** peer counseling and retention activities
- **Technology Proficiency:** exposure to current trends in technology – software and instrumentation in the lab
- **Academic Attainment:** academic counseling and tutorials
- **Financial Assistance:** stipends to support research
- **Collaboration:** inter-campus, inter-agency, and community
- **Student Tracking:** graduating senior questionnaire
- **Graduate School Preparation and Enrollment:** GRE Prep, application/admissions workshops and student panels; Bridge to the Doctorate opportunity for LSAMP graduate fellowships



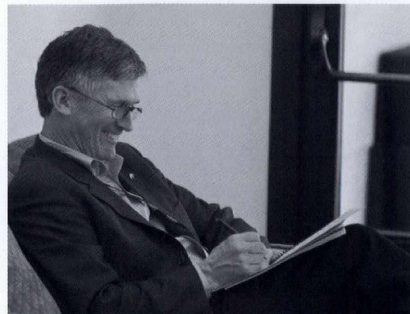
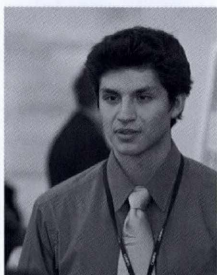
*“This symposium has given me the opportunity to network extensively with my UC peers, and surround myself with great students with the same goals and positive attitude.”*

—Undergraduate Presenter

## THE CAMP SYMPOSIUM AIMS TO:

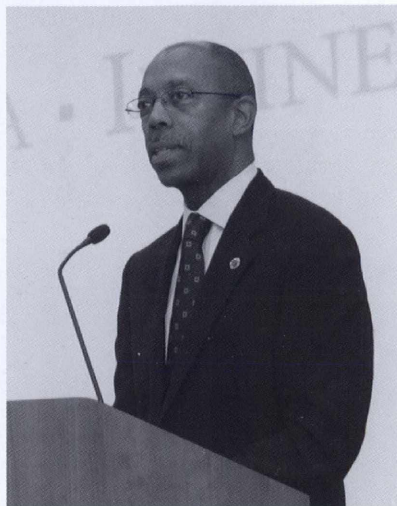
- Support undergraduate research with a faculty member;
- Encourage first-time presenters;
- Develop student written and oral communication skills;
- Provide a UC systemwide forum for faculty and students;
- Foster interest in and access to graduate education, particularly for the Ph.D.; and
- Set national standards for undergraduate research.

**In 2008, the University of California awarded 1,451 B.S. degrees in STEM to underrepresented minorities.**



*“As always, CAMP has been the highlight of my year. Wonderful organization and atmosphere.”*

—Undergraduate Presenter



“Presenting at this symposium and attending the panels gave me a sense of empowerment knowing that there are others going through the same experience. It got me interested in grad school.”

—Undergraduate presenter

### WHAT DEFINES A CAMP STUDENT?

- NSF-eligible and declared STEM major;
- A commitment to STEM degree and career goals;
- Sets educational goals and is highly motivated;
- Participates in CAMP academic & social activities;
- Contributes to a culture of inclusion.

### UC IRVINE ALUMNI PANEL

- **Daniel Vera, Ph.D.** Moderator (B.S. Mathematics 2002; Ph.D. Mathematics 2006, Massachusetts Institute of Technology); Picoco LLC Financial Services, Newport Beach
- **Ruben Begino, D.D.S.** (1996 Biology); DDS UC San Francisco
- **Charles Dominguez, Ph.D.** (1996 Biology); Ph.D. Berkeley
- **Nasbi Guzman** (2004 Mechanical & Aerospace Engineering); Facilities Engineer, Conoco-Phillips,
- **Sarah Holguin, Ph.D.** (2003 Molecular Biology & Biochemistry); Ph.D. Massachusetts Institute of Technology (MIT)
- **Angelina Hernandez** (2007 Biology); Graduate Student & BD Fellow, Cal State LA
- **Karina M. Hernandez** (2004 Electrical Engineering); Systems Engineer, Raytheon Space and Airborne Systems
- **Omar Moreno** (2006 Physics); BD Fellow, Physics, Cal State LA
- **Jose Romero-Mariona** (2004 Information & Computer Science; M.S. 2006); BD Fellow, UCI; Ph.D. anticipated 2009
- **Michael Williams** (2007 Mechanical & Aerospace Engineering); UCI Graduate Student

Note: “BD” is Bridge to the Doctorate, a supplemental activity of NSF, supporting the first two years of graduate education. The BD is a nationwide program exclusively for LSAMP students.



Clockwise from left: Kika Friend, UC Irvine; Malika Bell, UC Santa Cruz; Diana Lizarraga, UC Berkeley; Christopher Olivera, UC Riverside; Dotti Pak and Julie Standish, UC Santa Barbara, Frank Nevarez, UC Los Angeles; Marjorie DeMartino, California LSAMP; Jacqueline Azize Brewer, UC San Diego; and, Renee Maldonado, UC Davis.

A CONVERSATION WITH

## Rafael Bras, Dean,

UCI HENRY SAMUELI SCHOOL OF ENGINEERING

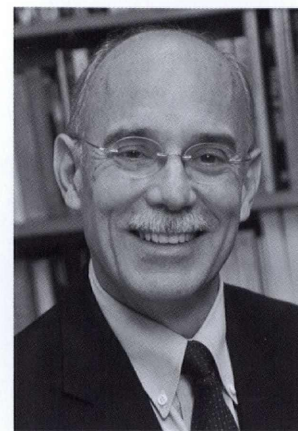


PHOTO BY L. BARRY HETHERINGTON

UC Irvine welcomed a new Dean of the Henry Samueli School of Engineering in the fall of 2008. Rafael Bras is a distinguished leader and scholar known for his work in hydrometeorology and global warming. His interests include land-atmosphere interactions. At MIT, he held an endowed professorship in the Department of Civil and Environmental Engineering and a joint appointment in the Department of Earth Atmospheric and Planetary Sciences. A fellow of the National Academy of Engineering and of the American Association for the Advancement of Science, and author of more than 170 refereed journal publications, he is listed as a Highly Cited Researcher by ISI. After 40 years at MIT, where he earned a Ph.D. in Water Resources and Hydrology, Bras arrived at a point where he was ready for change and challenge. That decision led him to relocate to Southern California, and a new venture in higher education. Dean Bras shares his personal and professional observations and some of his plans for the School of Engineering, in a conversation with Marjorie DeMartino, California LSAMP Co-Project Director.

**Making the change:** I had done most of the things I wanted to do there and I needed more. I have always been challenged by developing institutions and moving forward. UC Irvine provides exciting new prospects. It's a place of nimbleness and flexibility. It has a good legacy and a good trajectory. I also was impressed with the openness and friendliness of the campus and its leadership. UCI is exciting and young and aggressive place, and in a position to be even better.

**Strengths of UCI and the School of Engineering:** The School has young faculty willing to define the future. UCI's location is another strength. We are surrounded by a significant number of industries and enterprises operating at the frontiers of knowledge. For example, biomedical research and development and communications offer unique opportunities. And also, the community is close to the university; they have grown together hand-in-hand. Their destinies are tied together. It's also very different from my experience. I grew up as a boy in San Juan, Puerto Rico, then moved to Boston, both cosmopolitan cities. But I love the proximity of home to campus, living within walking distance of work.

### **Vision for the School of Engineering:**

Just recently I began a schoolwide planning effort, a series of thorough discussions with all the faculty, to chart our future for the foreseeable time. We are discussing programmatic areas, research areas. I expect that the School will attain high growth, more faculty, and hopefully a better ratio of students to faculty. We are an educational institution, and everything we do has to have education at its central core.

**Key Areas of Engineering Research:** There are four key areas which are interrelated: engineering of human health, environmental health, sustainable energy, and communications and information. For things to be useful, there has to be integration. ... Biology is now ubiquitous, it's in everything. Biomedical engineering is in demand, and there is a lot of biology work in electrical engineering, environmental engineering, and chemical engineering. Engineers synthesize, put things together, make models, recognize patterns. We like to look at things systematically, see how they interact. I predict that this movement of engineering and biology will ultimately converge many years from now, so, perhaps future biologists will be engineers.

**Today's Students:** In the past six years, I taught only freshmen. It was absolutely, completely refreshing, partly because I was running a program off the beaten path. My pleasure and amazement was to see what these students could do without much knowledge. They worked in teams on a problem with global dimensions, such as how would you rebuild New Orleans? or deforestation in the Amazon or tsunami prediction in the Pacific. They had to present an analysis and solution at the end of the quarter, and defend their findings to a panel of experts. When given the opportunities, our students are more creative. They can achieve amazing things. I'm very impressed with their thinking. Today's students are handling a lot more, and there's information coming from every side.

### THE HENRY SAMUELI SCHOOL OF ENGINEERING DISTINCTIONS (2007-08)

- Full-time faculty: 108
- Research expenditures: \$21.9 million
- Undergraduate enrollment: 2,215
- Graduate enrollment: 688
- Ranked 37th in U.S. News and World Report's 2008 listing of best engineering graduate schools

(source: Henry Samueli School of Engineering online information)

Dr. Bras succeeds Nicolaos Alexopoulos, who served as dean for ten years, and had supported the creation of new research centers and the expansion of the faculty and student enrollments, which nearly doubled under his leadership.

# Presenters and Awardees

## BIOLOGICAL / LIFE SCIENCE ORALS

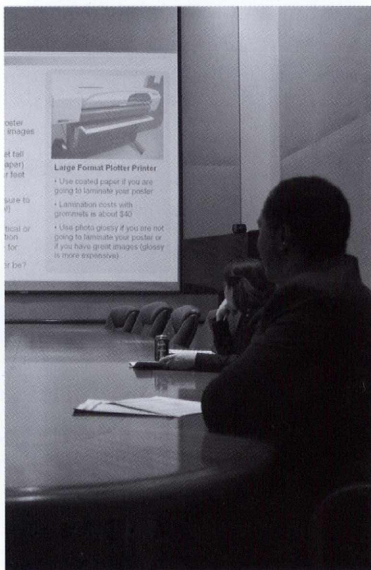
**Stephanie Alfonso**, UC San Diego  
**Alexandra Arreola**, UC Davis  
**Jillian Larsen**, UC Riverside  
**Gabriel Martinez**, UC Santa Barbara  
**Roxanna Ochoa**, UC Irvine  
**Olubusola Oluwole**, UC Santa Cruz  
**Briana Rice**, UC Riverside  
**Lauren Sanchez**, UC Los Angeles  
**Michael Stone**, UC Los Angeles  
**Shewit Tekeste**, UC Santa Cruz  
**Natalie Wilson**, UC Santa Barbara

## BIOLOGICAL / LIFE SCIENCE POSTERS

**Esmeralda Aguayo**, UC Merced  
**Fatima Barragan**, UC Merced  
**Michelle Crespo**, UC Los Angeles  
**Vera Diaz**, UC Merced  
**Erin Jimenez**, UC Los Angeles  
**Alfonso Lopez**, UC Berkeley  
**Yimdriuska Magan**, UC Merced  
**Lisandro Maya-Ramos**, UC San Diego  
**Christian Michel**, UC Riverside  
**Charlene Rocha**, UC San Diego  
**Geraldina Rodriguez**, UC Los Angeles  
**Ivan Rodriguez-Pinto**, UC Los Angeles  
**Ashley Sanders**, UC Santa Cruz  
**Santi Srijumngong**, UC Los Angeles  
**Debi Thomas**, UC Davis  
**Yolanda Tinajero**, UC Los Angeles  
**Elisa Vega**, UC Santa Barbara  
**Jennie Vergara**, UC Irvine  
**Lindsay Williams**, UC Los Angeles

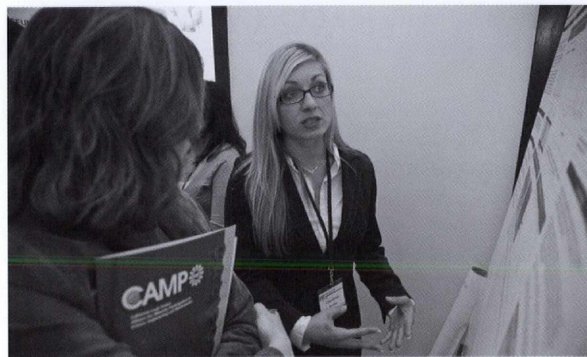
## PHYSICAL SCIENCE / ENGINEERING ORALS

**Joaquin Camacho**, UC San Diego  
**Ernesto Carrillo**, UC Santa Barbara  
**Cheryl-Lynn Chow**, UC Davis  
**Jonathan Compton**, UC Santa Barbara  
**Antoinette Corbin**, UC San Diego  
**Vidal Cortes**, UC Irvine  
**Graciela Cruz**, UC Davis  
**Corina De Pablo**, UC Irvine  
**Jorge De Paz**, UC Irvine  
**Ricardo Komai**, UC Irvine  
**Patricia Millan**, UC Irvine  
**Jonathan Moore**, UC Riverside  
**Jorge Ortiz**, UC San Diego  
**Melissa Padilla**, UC Los Angeles  
**Andre Paredes**, UC Irvine  
**Edi Rocha**, UC Riverside  
**Paul Suarez**, UC San Diego  
**Timothy Thatcher**, UC Irvine

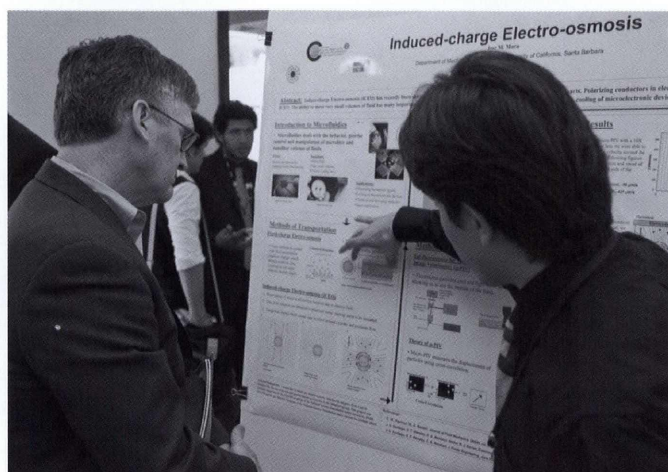
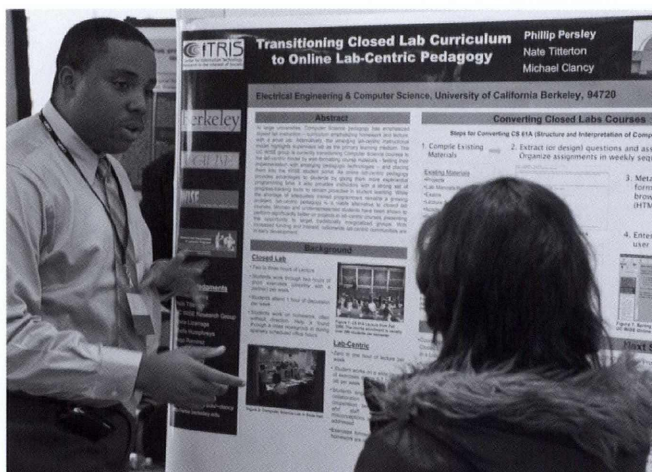


*The CAMP experience allowed us to 'interconnect' with others from similar backgrounds, different campuses. Thus, making the University of California one entity."*

—Undergraduate presenter







## PHYSICAL SCIENCE / ENGINEERING POSTERS

**John Aguilar**, UC Irvine

**A. Acevedo-Cabrera**, UC Berkeley

**Frank Avedo**, UC Irvine

**April Bautista**, UC Santa Cruz

**Aaron Botello**, UC Irvine

**Monica Casteneda**, UC Irvine

**Stephanie Chaidez**, UC Riverside

**Nery Chapeton**, UC Irvine

**Wilbert Copeland**, UC San Diego

**Aurea Gomez**, UC Santa Barbara

**J. Gordillo-Kerby**, UC Berkeley

**Casey Gorish**, UC San Diego

**Jennifer Guerrero**, UC Los Angeles

**Paul Levine**, UC Santa Cruz

**Ben Lluncor**, UC Los Angeles

**Maryluisa Molina**, UC Davis

**Jose Muro**, UC Santa Barbara

**Manuel Olmeda**, UC Santa Barbara

**Michael Perez**, UC Berkeley

**Phillip Persley**, UC Berkeley

**Teffany Rivas**, UC Irvine

**Helen Sanchez**, UC Irvine

**Edna J. Santillan**, UC Irvine

**Sandra Tran**, UC Irvine

**Sara Valdez**, UC Berkeley

**Carmen Valladares**, UC Davis

**Robert Valtierra**, UC San Diego

**Belen Vasquez**, UC Irvine

## ROLE OF THE CAMP FACULTY MENTOR

- Provide supervision and support for the CAMP undergraduate researcher by introducing him or her to the culture of the laboratory;
- Support the student in formulating a research question, drafting project goals, and a timeline with specific benchmarks;
- Advise the student in establishing realistic parameters and objectives for their part in a team research or individual project;
- Guide the preparation of a research proposal tailored to the student's particular field of interest and the focus of inquiry;
- Supervise or facilitate undergraduate student research projects in the laboratory and, if appropriate, provide guidance for writing an abstract or preparing a poster or oral presentation; assist in submission of the abstract for presentation at a scientific or professional symposium.



# Award Winning Presentations

## Physical Sciences/Engineering/Computer Science Orals

### AUTOIGNITION AND EXTINCTION OF JP-8 JET FUEL, GASOLINE AND FUEL SURROGATES

JOAQUIN CAMACHO, 5th Year Senior, Chemical Engineering  
Prof. Kal Seshadri and Dr. Stefan Humer, Center for Energy Research, UC San Diego

Critical conditions for autoignition and extinction of JP-8 jet fuel, gasoline and fuel surrogates are investigated in the counterflow configuration. The composition of common fuels varies from batch to batch. As such, measurements of critical conditions for JP-8 and gasoline are compared against measurements of fuel surrogates to determine if the targeted behavior is standardized by the surrogate. The ability to simplify the critical conditions contributes to the understanding of the chemical kinetic mechanisms for combustion of JP-8 and gasoline. The effectiveness of the UCSD surrogate and the Utah surrogate for mimicking the behavior of JP-8 was acceptable in counterflow premixed and non-premixed flames. However, the UCSD surrogate was deemed to be a more effective surrogate because it is made with a smaller number of components than the Utah sur-

rogate. In non-premixed flames, both JP-8 and the surrogates have autoignition temperatures ranging from 1180-1220K when the strain rate is varied from 300-600 s<sup>-1</sup>. The maximum strain rate where premixed JP-8 and surrogate flames extinguish occurs at an equivalence ratio of 0.95. Similar autoignition and extinction behavior was observed in gasoline, the Stanford surrogate and the Pitz surrogate. Gasoline and surrogates have autoignition temperatures ranging from 1180-1220K when the strain rate is varied from 350-650 s<sup>-1</sup>. Strain rates at extinction for gasoline and surrogates range from 100-325 s<sup>-1</sup> when the fuel mass fraction varies from 0.20-0.45. However, the critical conditions for the Pitz surrogate were closer to gasoline because the surrogate was developed specifically for counterflow flames.

### CHARACTERIZING GREENHOUSE GAS EMISSION POTENTIAL OF SECOND HAND APPLIANCE MARKET

GRACIELA CRUZ, Junior, Civil Engineering  
Deb Niemeier, Ph.D., P.E., Civil and Environmental Engineering, UC Davis

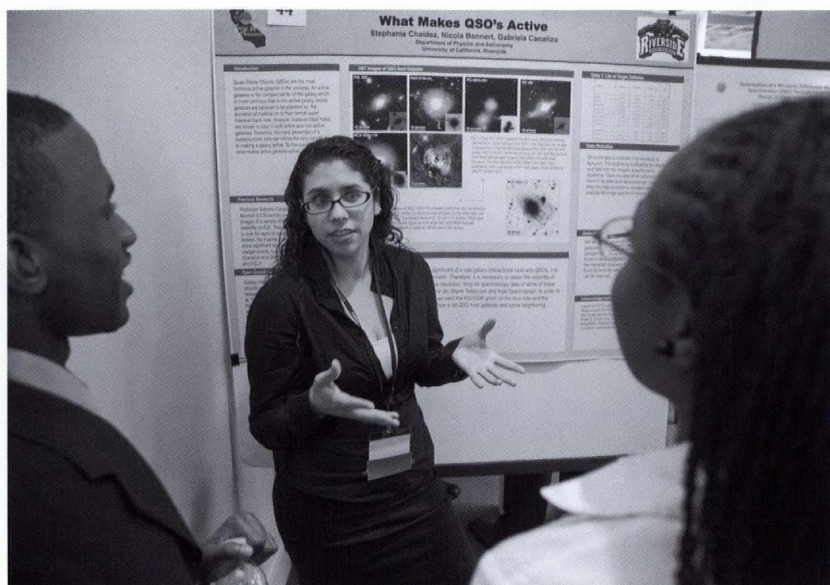
To achieve sufficient near-term reductions in greenhouse gas emissions (GHG) emissions, all aspects of the economy must become engaged. The residential sector accounted for 21% of national CO<sub>2</sub> emissions in 2005 and 13.5% of California CO<sub>2</sub> emissions for 2004, the most recent year from which data is available (CEC, 2006 and EIA, 2006b). California has some of the more stringent household energy efficiency standards in the country. A refrigerator sold today uses just 25% of the energy of an appliance sold just five years ago. Although consumers are increasingly purchasing more energy efficient appliances,

not much is known about the second hand market and the effect that it may have on climate change. This research examines the appliances being sold on the second-hand market by conducting a survey of appliances listed on Craigslist, a popular site for second hand trading and selling in the Sacramento and San Francisco area. The survey catalogs the energy efficiency characteristics of the appliances that are currently being sold. The results of the research will help to increase our understanding of the relationship between second hand appliances use, resale and energy consumption.

*I felt that everyone's research was very interesting,  
and it was nice to meet our counterparts in other UCs.*

—Undergraduate presenter





- ✓ Very polished presentation—good grasp of objectives and research details.
- ✓ Very comfortable describing data and research.
- ✓ Good giving credit where due.
- ✓ Professional and confident.
- ✓ Handled questions well.
- ✓ The student was poised, articulate, and enthusiastic.
- ✓ Excellent momentum for further research.
- ✓ Very knowledgeable.

## MODEL ANALYSIS OF CONTROLLED RELEASE METHODS FOR VACCINE DELIVERY VEHICLES

*JONATHAN MOORE, 5th year Senior, Electrical Engineering  
V.G.J. Rodgers Research group. Department of Bioengineering, UC Riverside*

Vaccines can provide many different benefits to sustaining human life. However some vaccines are more difficult to administer effectively than others. Many vaccine treatments may often require excessive delivery regimens in order to be effective. It is possible that by slowing the release rate of a vaccine, a single treatment may be effective for a longer period of time. In testing an effective delivery method for release of these growth factors, we use a computer-modeling program called Comsol to observe the release rates of the micro particles containing specific drugs or proteins. It is necessary for release to be controlled over a period of time in order for the materials to have extended exposure to the receptors in the body. This extended exposure could typically require two to three weeks, something not practical with current de-

livery methods that would typically release the entire mass at once. One method is to use a cylindrical micro-particle that would contain many smaller spherical micro particles. Both the large and smaller micro-particles contain a specific mass of the protein. The release method of this device should allow for a more controlled release of the protein by bringing the protein levels in the body to a closer equilibrium with the levels inside the device. The steady equalization in the concentration gradient will prevent the proteins from releasing at an insufficiently high rate. Comsol allows us to examine models that will give us precise views of the amount of mass released at specific intervals. These models will become examples for future research involving controlled vaccine release methods.

## TOWARDS MOLECULAR ANALOGUES OF MACROSCOPIC GYROSCOPES

*MELISSA PADILLA, Senior, Chemistry  
Miguel A. Garcia-Garibay, Ph. D., Department of Chemistry and Biochemistry, UCLA*

Macroscopic gyroscopes are devices used to measure changes in orientation based on the principle of conservation of angular momentum. The simplest model consists of a rotator whose center of mass lies on the spinning axis that is linked to a stator, which provides a rigid frame for the entire system. We are interested in preparing molecular analogs of gyroscopes, fine-tuning their rotational dynamics, and studying their physical properties, with the goal of applying the knowledge obtained to the development of molecular machines. We are synthesizing 2,2,5,5-tetra-

fluoro-bis(triphenylsilyl)bicyclo [2.2.2]octane a molecular analogue to macroscopic gyroscopes, with the intention of studying its dynamics in the solid state to determine if the introduction of a dipole allows for control in the solid state. The key step in this synthesis was fluorination of dimethyl 2,5-dioxobicyclo[2.2.2]octane-1,4-dicarboxylate (1) to dimethyl 2,2,5,5-tetrafluoro[2.2.2]bicyclooctane-1,4-dicarboxylate (2), (34% yield) using diethylamino sulfurtrifluoride (DAST).

## Physical Sciences/Engineering/Computer Science Posters

### ANALYSIS OF THE LIPID SYNTHESIS PATHWAYS IN A THERMOPHILIC ARCHAEON *ARCHAEOGLOBUS FULGIDUS*

BEN LLUNCOR, Senior, Chemical and Biomolecular Engineering

Professor Harold Monbouquette, Denton Lai, Chemical and Biomolecular Engineering, UCLA

Archaea constitute a third domain of life, separate from Eukarya and Bacteria, due to their ability to thrive in extreme conditions such as high temperatures, pressures, salinity, and pH. Key to the survival of archaea and its maintenance of homeostasis is the unique isoprenoid bonding exhibited by membrane lipids. In the thermophilic archaeon *Archaeoglobus fulgidus*, the enzymes (S)-2,3-Di-O-geranylgeranyl-glycerol phosphate synthase (DGGGPS), encoded by gene AF0404, and (S)-3-O-geranylgeranyl-glycerol phosphate synthase (GGGPS), encoded by gene AF0403, are involved in the biosynthesis of isoprenoid bound tetraether and diether archaeal membrane lipids. These enzymes were identified through gene homology with another thermophilic archaeon,

*Sulfolobus solfataricus*. The enzymes further downstream in the archaeal lipid synthesis pathway have not been identified nor has their catalytic function been explained. In the hopes of elucidating the *A. fulgidus* lipid synthesis pathway, two pathway enzymes, GGGPS and DGGGPS, were expressed in *E. coli*. The genes AF0403 and AF0404 were placed in tandem into the expression vector pET15b under the T7 promoter. The genes were marked with an N terminus histidine tag. To date expression of AF0403, as GGGPS was detected by immunoblot, was achieved. DGGGPS was not detected on the immunoblot, indicating a lack of expression of AF0404. Ultimately, our goal will be to express the entire isoprenoid lipid biosynthesis pathway of *A. fulgidus*.

*The CAMP experience allowed us to ‘interconnect’  
with others from similar backgrounds, different campuses.  
Thus, making the University of California one entity.”*

—Undergraduate presenter

### STRESS REDUCTION OF ION BEAM SPUTTER DEPOSITED SiC FILMS BY VARIATION OF DEPOSITION PRESSURE

SARA VALDEZ, Junior, Mechanical Engineering

David Myers, Muthu Wijesundara, and

Albert P. Pisano, Ph.D. Department of Mechanical Engineering, UC Berkeley

Experiments are preformed to lower the stress of the ion beam-assisted, sputter-deposited amorphous Silicon Carbide (SiC) thin films. A custom made Ion Beam Assisted Deposition System is used to sputter SiC for micro and nano fabrication. Currently, the films deposited by this system have compressive stresses of approximately 1000 MPa. Thin films with these high stresses typically curl when released, ruining the necessary flatness required for MEMS sensors. In extreme cases, these high stresses can cause SiC to delaminate from the substrate entirely. Therefore, in order for these SiC thin films to be useful for MEMS

devices, the stress of the SiC must be lowered to approximately 100 MPa. To run this experiment, the deposition pressure is raised by flowing argon to the system during the deposition. The SiC film thickness and curvature measurements are taken to estimate the stress in the thin SiC film. Preliminary results indicate that increasing depositing pressure decreases the stress of the film showing the viability of tailoring thin film stresses using deposition pressure. In the future, other stress lowering means such as ion annealing, thermal annealing, as well as other processing parameter changes will be explored.

## QUANTITATIVE GENETIC INTERACTION MAPPING OF TRANSCRIPTION FACTORS AND KINASES IN YEAST

WILBERT COPELAND, Senior, Bioengineering

Trey G. Ideker, Ph.D., Departments of Bioengineering and Bioinformatics, UC San Diego

Examining the genetic interactions of double-deletion strains of the yeast *Saccharomyces cerevisiae* has proven useful in determining functional relationships between genes. In this study, we systematically examined all possible double deletions between 120 kinases and 240 transcription factors in yeast. Through growth rate profiling of double mutants

both alleviating and aggravating genetic interactions were identified and used to determine the pathway organization of proteins. In the future this data will be used to identify transcription factor regulation at the level of phosphorylation as well as to predict the role of kinases and transcription factors of unknown function within *S. cerevisiae*.

- ✓ Very good job setting up justification for work. Student clearly knows topic well; can work on relaxing a bit, and this will come with practice.
- ✓ Poised and clear presentation. Student did a large amount of independent work.
- ✓ Congratulations on conducting essentially independent research. Good poster.
- ✓ Interesting work! For the poster, try to have larger font size and perhaps fewer words.
- ✓ Presentation was very rapid and difficult to follow.
- ✓ Really understood the project design & parameters.



## INDUCED-CHARGE ELECTRO-OSMOSIS

JOSE M. MURO, Senior, Mechanical Engineering

Dr. Carl D. Meinhart, Mechanical Engineering Department, Gaurav Soni, UC Santa Barbara

Development of microscale devices for pumping fluid without moving parts has been an important area of research. The ability to move very small volumes of fluid has many important applications such as, dispensing therapeutic agents into the body, cooling of microelectronic devices and chemical/biological analysis. Transporting fluids at small length scales (10-6m and 10-9m) allows for certain scaling laws to be used. An example includes, electric fields that can be used to attract charged ions in a fluid, causing an overall flow. Induce-charge Electro-osmosis (ICEO) has recently been shown to create fluid flow at the microscale. Polarizing conductors in electrolyte solutions by means of an electric field causes ICEO. This project deals with the numerical and experimental investigation of ICEO flow around a metal

cylinder. A device for studying ICEO experimentally was created. Micro Particle Image Velocimetry ( $\mu$ -PIV) was used to calculate the velocity of the fluid around the cylinder. Flow was also simulated using a commercial finite element program. Symmetrical flow around a metal cylinder was achieved experimentally. The experiments showed velocities up to 50  $\mu\text{m/s}$  for an electric field of 16.66 V/cm. The experimental velocity was one order of magnitude lower than simulations. The direction of flow far from the cylinder surface was not congruent with that of the simulation. Closer to the surface of the cylinder the direction of the flow matched the simulation. Further studies need to be carried out to understand the unique flow patterns that occur far and close to the cylinder surface.

## Biological/Life Sciences Orals

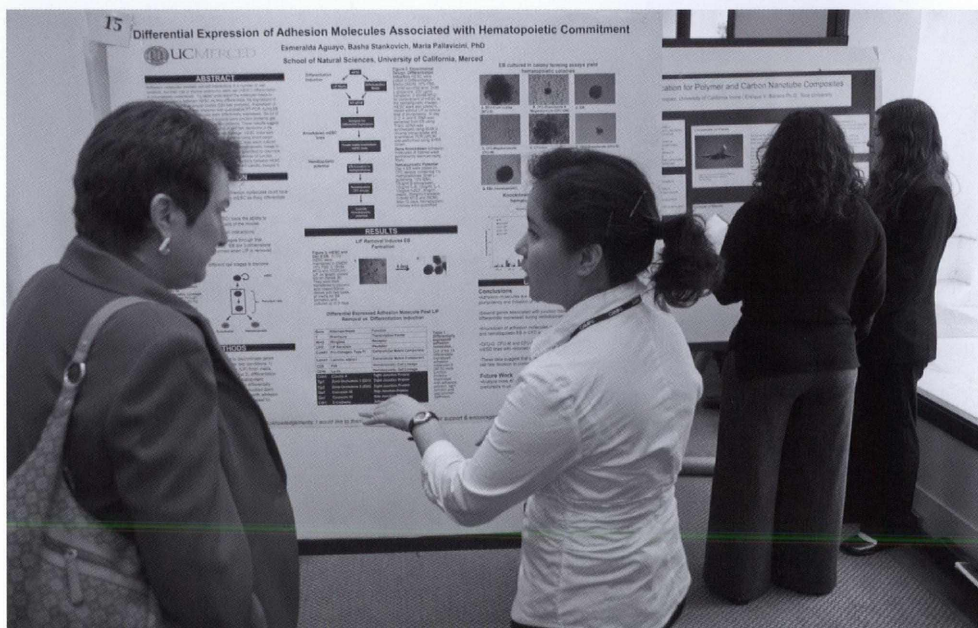
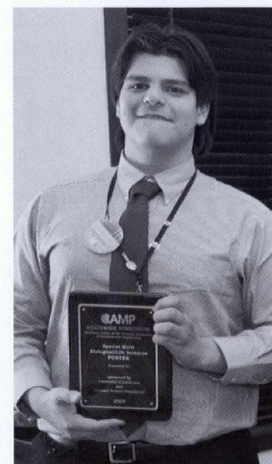
### FINDING PROTEIN INTERACTIONS WITH ABERRANT TESTA SHAPE USING A YEAST TWO-HYBRID SYSTEM

ALEXANDRA ARREOLA, Senior, Genetics  
Dior Kelley, Charles S. Gasser, UC Davis

In flowering plants, ovules are the precursors to seeds and are critical for plant reproduction. A wild-type *Arabidopsis* ovule has two integuments that surround the nucellus and female gametophyte. Various mutants have been identified in ovule development including aberrant testa shape (ats), in a gene encoding a transcription factor. This mutation has been shown to result in the fusion of the inner and outer integuments during development to form a single integument in the ovule. Because most transcription factors act in protein complexes, I hypothesize that

ATS requires co-regulators to regulate transcription. This project aims to identify proteins that interact with the ATS protein to regulate transcription in the ovules of *Arabidopsis*. To test this hypothesis I propose to identify these proteins, which may be co-regulators, through a yeast two-hybrid screen using a pistil cDNA library as the prey and the ATS protein as the bait. Identifying the protein-protein interactions ATS is involved in will provide further insight into what occurs in *ats* mutants and the molecular function of ATS in wild-type ovules.

- ✓ Good information density on Powerpoint.
- ✓ Knowledgeable, did calculations for project. Very good graphs. Include more experimental set up.
- ✓ Very interesting. Potential application in medical devices.
- ✓ Great enthusiasm, pace and articulation.
- ✓ Talk to the audience, not the slides.
- ✓ Very clear presentation, well organized. Not many results yet, but great potential.



## BACTERIAL ABUNDANCE IN THE SOUTH PACIFIC

NATALIE WILSON, *Junior, Biological Sciences*

*Dr. Craig Carlson, Department of Ecology, Evolution, and Marine Biology,  
Aubrey Cano, UC Santa Barbara*

Bacteria play an important role in the microbial food web. They take in dissolved forms of organic carbon into their cells that no other organisms can; this allows carbon to travel into higher trophic levels of the microbial food web. Bacterial abundance and activity is extensively studied in estuaries and oceanic coastlines; little is known about the overall distribution of bacteria in the open ocean. This project sought to find out where bacterial abundances are more concentrated in the open South Pacific. Samples of sea water were taken from different depths at certain latitudes of the P16South (150°W longitude) line, starting at the equator and ending near Antarctica. Microscope slides were made for each sample, and the bacteria were counted per milliliter. The different abundances were then plotted against environ-

mental parameters including latitude, depth, temperature, chlorophyll a, and dissolved organic carbon (DOC). There was no large change in abundance with latitude which may suggest that bacteria may have become well-adapted to different temperatures and environments. Abundance is higher at the surface than at lower depths. Surface waters can have a wide range of bacterial abundances which may be a function of water stratification due to temperature changes (near the equator) or salinity changes (near Antarctica). Chlorophyll a and DOC show weak positive relationships with abundance in the South Pacific. Although chlorophyll a and DOC are required for bacteria to grow and divide, variability in bacterial abundance seems to be more closely related to water stratification due to temperature or salinity.

## BIOCHEMICAL ANALYSIS OF SPERM MEMBRANE PROTEINS IN THE NEMATODE CAENORHABDITIS ELEGANS

BRIANA RICE, *Senior, Biology*

*Juan Fraire Zamora, Dr. Richard Cardullo, Department of Biology, UC Riverside*

In the nematode *Caenorhabditis elegans*, male and hermaphrodite individuals are present. The males produce only sperm and the hermaphrodites produce sperm early in development and then switch to the production of eggs. The eggs from hermaphrodites can be self-fertilized by sperm stored in their spermatheca or by sperm from males. Previous genetic studies suggest that there may be different spermiogenesis signaling pathways due to different environments for production of sperm in males and hermaphrodites. The present study focuses on the characterization of hermaphrodite sperm proteins in *C. elegans* to establish whether or not there are differences in protein composition compared to male sperm. Hermaphrodite sperm was isolated from *fem-3* mutants; *fem-3* is a temperature sensitive mutation that masculinizes

the germ line so that only sperm cells are produced in hermaphrodite worms. To achieve protein characterization we used a large scale sperm isolation method to collect samples. Sonication and differential centrifugation were used to render two cellular fractions: membrane and cytosol. Proteins from both fractions were separated by SDS-Polyacrylamide gel electrophoresis according to their mass. In order to visualize the separated proteins we used the silver stain method. The resulting protein patterns from the *fem-3* hermaphrodite sperm were compared with protein patterns isolated from male sperm. Future biochemical analysis of male and hermaphrodite sperm proteins will shed light on the molecular differences of cells produced in different environments that must achieve the same goal; fertilization of an egg.



## Biological/Life Sciences Posters

### 2,2',4,4'-TETRABROMODIPHENYL ETHER (BDE-47) CAUSES GROWTH RETARDATION AND MOTOR DEVELOPMENTAL DELAY IN PERINATALLY EXPOSED C57BL/6J MICE

DEBI THOMAS, Senior, Neurobiology/Physiology and Behavior  
Robert Berman, Ph.D., UC Davis

Polybrominated Diphenyl Ethers (PBDEs) are man made chemicals used as flame retardants in consumer products, including electronics and textiles. PBDEs are commercially manufactured as mixtures and added to polymers, but lack of chemical bonding to final polymer products allows for environmental contamination. High levels of BDE-47 are found in human adipose tissue, breast milk, serum, meat, fish and dairy products. Young children quickly accumulate BDE-47 from the environment; therefore, we chose to examine the possible neurotoxic effects of BDE-47 on the developing nervous system by evaluating

offspring of C57BL/6J mice perinatally exposed to BDE-47. Dams were orally exposed to 0, 0.03, 0.1 or 1.0 mg/kg/day of BDE-47 for 70 days until offspring weaning at postnatal day 21. Significant growth retardation and delayed motor development were apparent at a dosage of 0.1 mg/kg/day. Sensory assessment and stereological analysis of the hippocampal CA1 region showed no significant differences between dosage groups. These results warrant further examination of PBDEs and if risk to human health is indicated, banned usage would minimize potential exposure and adverse effects.

### AKT LOCALIZES TO THE INTERMEMBRANE SPACE IN MAMMALIAN MITOCHONDRIA

ERIN JIMENEZ, Junior, Molecular, Cell, and Developmental Biology  
Carla Koehler, Ph.D., Department of Chemistry and Biochemistry, UCLA

Recent studies have identified new pathways in the mitochondrial intermembrane space (IMS), including an oxidative folding pathway for the import of proteins and phosphorylation-dependent signaling. We are investigating the kinase AKT (also known as Protein Kinase B), a major serine/threonine kinase regulated by extracellular and intracellular signaling pathways and capable of inducing pro-survival and proliferative effects. Substrates of AKT include a number of signaling proteins, such as transcription factors, apoptotic machinery, and components of glycogen metabolism. Previously, it was reported that a fraction of the total cellular AKT localizes to the mitochondria in tissue culture cells. We have shown that, though it is present in both mouse brain and liver tissue, AKT only localizes to mitochondria

isolated from the brain. Furthermore, the fraction of AKT in the mouse brain mitochondria is active and localizes to the IMS. We also have data that suggest AKT may be loosely membrane-associated facing the IMS. This is in contrast to previously published data that suggests AKT localization to the mitochondrial membranes and matrix of tissue culture cells. We are currently investigating the mechanism of AKT import into the mitochondrion and the mitochondrial substrates and interacting proteins of AKT. This line of research will provide insight into AKT regulation and its cellular effects as well as a greater understanding of signaling pathways in the mitochondrial intermembrane space.

*“This is one of the best conferences I’ve attended. Friendliness, organization and sophistication is present everywhere.”*

—Undergraduate presenter





- ✓ Clear, crisp, concise presentation. Can benefit from being less anxious during presentation, because your knowledge base was excellent.
- ✓ Terrific enthusiasm for research project.
- ✓ Work on presenting research more systematically.
- ✓ Great job machining pieces of equipment for the apparatus.
- ✓ Good job explaining rationale and walking audience through data.

## OLFACTORY MEDIATED SEARCH IN DROSOPHILA

IVAN RODRIGUEZ-PINTO, *Sophomore, Undeclared Life Sciences*  
 Dr. Mark A. Frye, *Department of Physiological Science, UCLA*

Olfaction, the sense of smell, is crucial for an organism to track the volatile plumes emitted by sparse food resources. Behavioral responses to attractive odors are typically quite variable both within and between individuals. However, as far as we know, first-order and second-order olfactory neurons are activated by odors with little variation. The mechanisms by which flexible odor-tracking behaviors are regulated by robust olfactory sensory signals is not understood. Hungry flies were challenged to locate the source of a food odor tracking with a non-forced choice assay in freely mobile *Drosophila melanogaster* fruit flies. The time-course for locating the odor by wild-type flies is largely linear, hence providing a baseline to compare to genetic mutants. Recent

studies show that genetic mutations in learning and memory elicit better optomotor responses to visual stimuli than wild-type flies by reducing the random exploratory component of fly behavior. Therefore, genes involved in behavioral plasticity could influence the time-course of odor search behavior by minimizing the random exploratory behavior of a hungry fly. Six mutants were tested, and whereas four showed no significant differences from wild-type flies, two localized a food odor source more slowly in a manner similar to genetically blind flies. These results are consistent with the idea that learning and memory pathways also participate in fast flexible sensory reflexes.

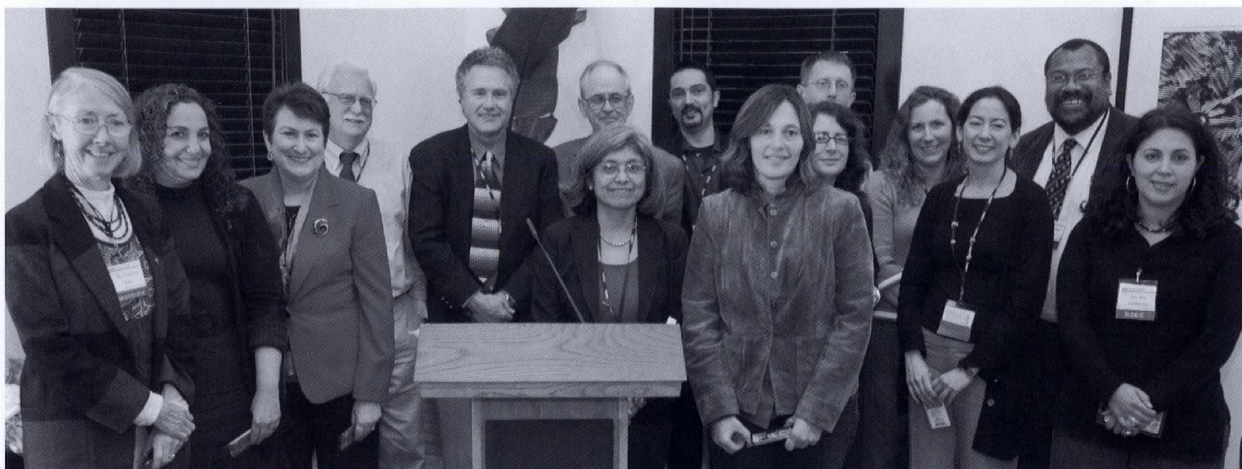
## DIFFERENTIAL EXPRESSION OF ADHESION MOLECULES ASSOCIATED WITH HEMATOPOIETIC COMMITMENT

ESMERALDA AGUAYO, *Junior, Molecular Cell Biology*  
 Basha Stankovich, *Maria Pallavicini, Ph.D., School of Natural Sciences, UC Merced*

Adhesion molecules mediate cell-cell interactions in a number of cell systems, but their role in murine embryonic stem cell (mESC) differentiation is incompletely understood. To better understand the molecular basis for cell-cell interactions between mESC as they differentiate, the expression of adhesion molecules in embryoid bodies (EB) was analyzed. Expression of forty adhesion molecules was analyzed with quantitative RT-PCR during EB formation. Thirteen target molecules were differentially expressed. Six out of thirteen (46%) differentially expressed proteins were junction proteins; gap junction, tight junction or adherens junction proteins. These results suggest that the six junction proteins

may have a role in cell fate decisions in the differentiation of mESC into the hematopoietic lineage. mESC lines were generated with stable knockdown of junction proteins using short hairpin RNA (shRNA) sequences. EB from knockdown mESC lines were cultured under conditions to induce differentiation along the hematopoietic lineage in colony forming assays. Hematopoietic colonies were quantified to determine hematopoietic potential in mESC with decreased expression of junction proteins. Understanding the adhesion molecule interactions between mESC allows for the possibility of guiding differentiation toward specific lineages in the future.

# Judges



## **CAMP Statewide - Lead Judge**

**Derek Dunn-Rankin, Ph.D.**, California LSAMP Co-Project Director

## **PHYSICAL SCIENCES/ENGINEERING**

### **Orals**

**Glenn Beltz, Ph.D.**, CAMP Director, Engineering, UCSB - *Moderator*

**Dorothy Pak, Ph.D.**, Materials Research Laboratory, UCSB

**Ana Corbacho, Ph.D.**, Biophotonics Science and Technology, UCD

**Philippe Relouzat, Ph.D.**, Learning and Academic Resource Center/  
Mathematics, UCI

### **Posters**

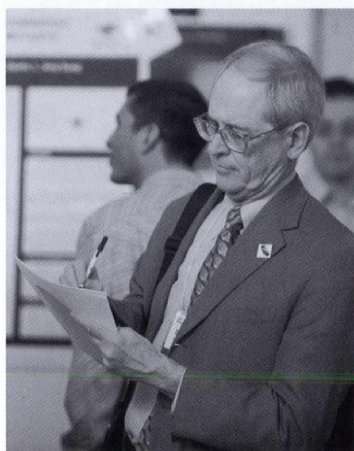
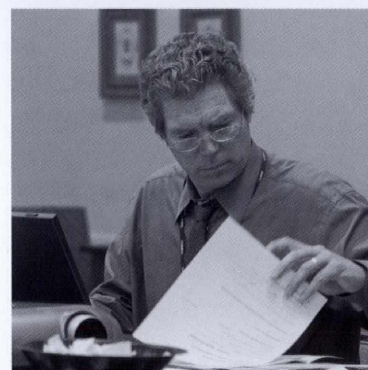
**George Johnson, Ph.D.**, CAMP Director, Engineering, UCB - *Moderator*

**James Shackelford, Ph.D.**, (CAMP Director Emeritus) Engineering, UCD

**Russell Flegal, Ph.D.**, CAMP Director, Toxicology, UCSC

**Rod Cole, Ph.D.**, CAMP Mentor, Physics, UCD

**Arnold Guerra, Ph.D.**, Physics, UCI and Orange Coast College



## **BIOLOGICAL/LIFE SCIENCES**

### **Orals**

**Caroline Kane, Ph.D.**, Molecular & Cell Biology, UCB - *Moderator*

**Patricia Halpin, Ph.D.**, Materials Research Laboratory, UCSB

**Richard Weiss, Ph.D.**, CAMP Director, Chemistry/Biochemistry, UCLA

**Julie Standish, Ph.D.**, Marine Science, MRL, UCSB

### **Posters**

**Judith Kjelstrom, Ph.D.**, Biotechnology Program, UCD - *Moderator*

**Carla Koehler, Ph.D.**, Chemistry and Biochemistry, UCLA

**Andrea Chiba, Ph.D.**, Neurobiology/Cognitive Science, UCSD

**Andres Sciolla, M.D.**, Clinical Professor, Psychiatry, UCSD

**Lydia Yoshida, Ph.D.**, Minority Science Programs, Bio Sci, UCI

*“As a judge, I would recommend this meeting to any mid-career or senior researcher from an underrepresented minority background in a heartbeat. If you are looking for a place to feel amazed, inspired and hopeful at the work of future generations, this is the place for you. At the symposium I met a couple of the brightest students I have ever met in my life, and mingling with the cream of the crop of UC students was a truly remarkable experience.”*

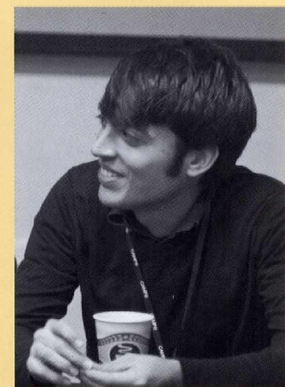
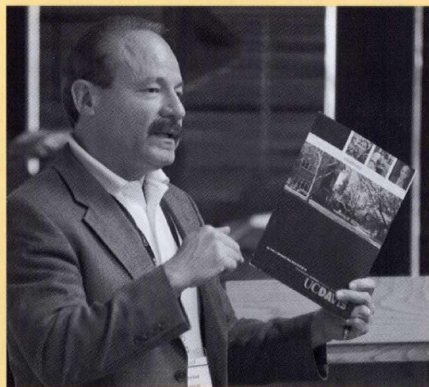
—Dr. Andres Sciolla,  
Clinical Professor, Psychiatry, UC San Diego



### **PARTICIPATING BD FELLOWS**

**Lucas Arzola, Gerardo Rocha, Cecilia Osorio**, UC Davis; **Alicia Gamez, Anthony Farina, Sergio Sandoval, Roberto Tinoco**, UC San Diego  
**Hector Cuevas**, UC Davis Graduate Studies, Panel Moderator

## **BRIDGE TO THE DOCTORATE (BD) PANEL AND POSTER SESSION**



*“This was a great symposium! The grad student [BD] panel as very informative & helpful. I had the opportunity to network with grad students and learn about how to make a poster. I definitely feel more motivated to go to graduate school and obtain a Ph.D.”*

—Undergraduate Observer



## CAMP Spotlight: UC Berkeley

**ANA LUZ ACEVEDO-CABRERA, UC BERKELEY GEOPHYSICS**

### **CAMP Scholar Conducts Research on California-Relevant Topic: Seismic Research**

**Ana Luz Acevedo-Cabrera**, a Berkeley senior majoring in Geophysics, sometimes needs a hard hat when she conducts research. She plans to be an earthquake engineer, and she has had some authentic experiences pursuing her goal. In summer 2008, she worked with civil and environmental



*Ana Luz is an active CAMP-er, and has worked with CAMP Coordinator Diana Lizarraga on numerous professional development and social activities, including as Cal NERDS Ambassador for the NorCal Forum for Diversity in Graduate Education.*

#### **BERKELEY NEWSBITE:**

**UC Berkeley senior Amelia Ramirez-Correa** is co-author on her first publication: McAllister, S. Lai, J., Scott, S., Ramirez-Correa, A. Fernandez-Pello, C., Urban, D., and Ruff, G. "Effect of Pressure on Piloted Ignition Delay of PMMA," at the 46th American Institute of Aeronautics and Astronautics Aerospace Sciences (AIAA) meeting, Reno, Nevada, 2008. AIAA is "the shaping, dynamic force in aerospace—the forum for innovation, excellence and global leadership."

engineers on seismic safety in building construction. She previously conducted research on seismic tomography of Western North America, a project which she presented in a poster at the 2008 CAMP Statewide Undergraduate Research Symposium. She also presented at Sigma Xi Annual Meeting and Student Research Conference, November 22, 2008. The meeting focused on the global water crisis (H2O 08 - Science, Policy, Ethics), which many consider the most critical issue in science today.

#### **SEISMIC PERFORMANCE OF FRICTION PENDULUM BEARINGS IN LIQUID STORAGE TANKS**

*Ana Luz Acevedo-Cabrera, Vladimir Calugaru, Stephen Mahin, Ph.D.,  
Civil and Environmental Engineering,  
University of California, Berkeley*

Most of the catastrophic effects of earthquakes are a result of buildings collapsing due to inadequate consideration of seismic safety conditions. Seismic safety can be improved in a variety of ways, but the method that most effectively protects the contents of a structure is by utilizing seismic isolators: elastomeric bearings and/or sliding systems. This research focuses on sliding systems, specifically Friction Pendulum Bearings (FPB). Special attention is placed on the seismic performance of liquid storage tanks with FPB. Other studies have shown that FPB reduce the base shear and overturning moment on liquid storage tanks by up to 80%. In this experiment, the performance of FPB under primarily single-directional excitation, but also bidirectional and tridirectional excitation in liquid storage tanks will be evaluated. This will be done by post-processing of the experiment's camera recordings, load cells, strain gauges, and twin-wire probes to measure the sloshing of water inside the tank. This experiment will test the tank on top of an earthquake shake table both with and without the FPB in order to obtain comparable results and determine the isolators' effectiveness. It is expected that FPB will reduce the base shear, overturning moment, and sloshing of the water inside the tank.

## ANA LUZ ACEVEDO-CABRERA

### HONORS & ACTIVITIES

- First Place Poster, Content Category, "Seismic Tomography of Western North America," Undergraduate Research Opportunities Program, 2008 Science and Engineering, UC Berkeley
- Associate Member, Sigma Xi, The Scientific Research Society, UC Berkeley Chapter
- UC LEADS Scholar, UC Leadership Excellence through Advanced Degrees
- CAMP Scholar, California Alliance for Minority Participation
- Research Assistant, Dept. of Civil and Environmental Engineering, Earthquake Engineering Research Center; Department of Earth and Planetary Science, Berkeley Seismological Laboratory
- Undergraduate Panelist, CAMP/UC LEADS/Engineering organizations
- Tour Guide, Gear-Up summer program, North Monterey County Middle School
- Tutor: Pre-Calculus, Berkeley Scholars to Cal, Berkeley High School; Mt. Toro Continuation High School, Salinas, CA
- International House Council, International House at UC Berkeley
- Academic Chair and Historian, Sigma Pi Alpha Sorority Inc., UC Berkeley Alpha Chapter

### RESEARCH PRESENTATIONS

- NSF LSAMP UC Statewide Research Conference 2008: UC Irvine
- American Geophysical Union Annual Conference 2007: San Francisco, California
- Sigma Xi Annual Conferences 2007 and 2008: Florida & Washington D.C.
- Society of Hispanic Professional Engineers Annual Conference 2008: Arizona
- Society for the Advancement of Chicanos and Native Americans in Science Annual Conference 2007: Kansas City, Missouri

### PROFESSIONAL SOCIETY MEMBERSHIPS

- Society for Advancement of Chicanos and Native Americans in Science (SACNAS), UC Berkeley Chapter
- Geological Association at Berkeley, University of California Berkeley, Department of Earth and Planetary Science
- Hispanic Engineers and Scientists and Society of Hispanic Professional Engineers, UC Berkeley Chapter
- Concrete Canoe, American Society of Civil Engineers, UC Berkeley Chapter

### COLLEGE PREP EXPERIENCE

- COSMOS-UC Santa Cruz

## Q&A WITH ANA LUZ ACEVEDO-CABRERA

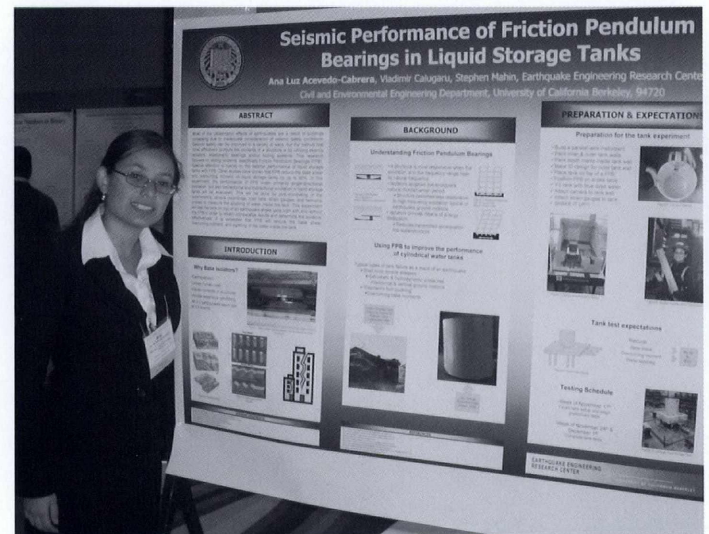
**What is the importance of earthquake engineering (in California) and why you are interested in a career as an earthquake engineer?**

I am interested in a career as an earthquake engineer because an earthquake can leave a city in ruins if its infrastructure is not ready to face this type of natural disaster. Unfortunately, by geological destiny, California is at a disadvantage, so there is an imperative need for revitalizing structures throughout the state. I would hate to hear in the news one day that thousands of people were left homeless and years of research instantaneously disappeared because we were not prepared to face "The Big One."

**Who inspired you to major in geophysics? How did you come to select this major?**

I was first inspired to consider studying Earth Sciences after my experience in oceanography during a science program called COSMOS [California State Summer School for Math & Science], the summer before my senior year in high school. Thus, I decided to apply to UC Berkeley as an Earth and Planetary Science major. My interest in Earth science further developed after my first semester in college during which time I took three geology classes. One of them in particular captivated my attention: "Earthquakes in Your Backyard," an introductory course in seismology. One day I

decided to speak with the professor and I asked him what I should major in to study earthquakes, and his response was geophysics. Hence, at the end of my first semester I declared Geophysics! As logical of a decision as it seems, it was still a bit difficult because part of me wanted to study civil engineering. I resolved this issue by still making time in my schedule to take some civil engineering classes for fun, and



most of them are actually going to count towards the structural engineering minor I am pursuing today.

**What is it like working with your faculty mentors?**

I really enjoy working with my faculty mentors because they are passionate about their fields. Sometimes it can be hard to meet with them because they might have to leave campus for a couple days for several reasons including field research, meetings with colleagues, or giving a talk at a conference. However, their absence is only momentary and when they return they are usually nice about checking in and making sure everything is okay. The best part is that they are usually understanding and they don't expect me to get everything right on the first go, so I feel less pressure, and I am more comfortable asking questions.

**It seems like your research is somewhat “physical” requiring a hard hat—can you comment on this? What do you enjoy most about seismic research?**

For the earthquake engineering research I began this past summer I was expected to wear a hard hat any time I was inside the Earthquake Engineering Research Center Earthquake Simulator Laboratory (also known as the Shaking Table Lab) because seismic research conducted here deals with up to life-size structures made of primarily steel and concrete. Wearing a hard hat not only makes me feel more secure, but also gives me confidence in myself that regardless of the fact that I am a woman, I am still capable of conducting engineering research. My experience in the research lab was pretty comfortable because even though all of the laboratory staff were male, they still respected me and did not make me feel like I was a fragile person that could not handle the physical part of the job. It was so much fun! They even taught me how to use a hand driller, oil-based paint, and how to build my own instruments. At the end of the day, my favorite part about seismic research is when testing season comes along because I get to see the structures or tanks I worked on, get shaken up!

**Is graduate school in your future? If so, what would be your dream program/institution?**

Graduate school is definitely in my plan. I have enjoyed the research, so grad school is the next logical step. In fact, if all goes as expected, I should be applying to Ph.D. programs next fall. I have not yet decided which is my dream program/institution

because I am interested in the research performed at several institutions, but I do hope to get all these details figured out this summer.

**Where did you go to high school? What got you interested in applying to Berkeley?**

I went to North Monterey County High School, a small public school surrounded by artichoke and strawberry fields outside the town of Castroville, California. I first got interested in applying to Berkeley because I had visited the campus during my COSMOS summer science experience. I also liked the fact that it was two hours away from home which I thought to be the perfect distance for becoming independent, but also being at a close proximity to my family.

**What keeps you going? (considering the pressures faced by today's science majors)**

The hope that one day I can contribute to saving peoples' lives by developing effective earthquake early warning systems and improving current base isolators, dampers, and other earthquake hazard mitigation structural systems. I am aware that to reach this dream I will have to overcome several obstacles including the pressures faced by today's science majors, but I am confident that I will remain happy inside so long as I know that I have tried my best and poured my heart into the research.

**What do you do to relax?**

I always try to keep a balance between my mind, body, and soul, and so far it has worked because I am not tired of being a student yet. Currently, I am involved in a couple of academic and student government clubs, and at the same time I swim at least twice a week. Also, whenever I get a chance, I like to go out dancing!



## ROMINA RODRIGUEZ, XIORANNY LINARES, SARA VALDEZ, UC BERKELEY

### Cal Women In Engineering

**Romina Rodriguez, Xioranny Linares, and Sara Valdez** are engineers in the making who plan to earn their doctorates and make their mark in academia, government agencies, or in the private sector. They are engaged not only in their studies at Berkeley but in the community at large, including active members and leaders in engineering

professional societies and in giving back their talent and knowledge base through tutoring and mentoring. The three have amassed a distinguished record, individually and collectively, and apply their leadership skills and service widely on the Berkeley campus. Rodriguez, Linares, and Valdez are destined for great things!



*Romina Rodriguez (left), took home 1st place for her research poster Mass Flux of Plastics at Piloted Ignition and lead her team to victory, also taking 1st for the Academic Olympiad at the National Technical and Career Conference (NTCC) Research Competition in Washington, D.C. Xioranny Linares (center) and Sara Valdez (right), working with their UC Berkeley team, placed 3rd in the Engineering Design competition with their project Bear Pulse, a spacesuit designed to address the atrophy problems involved with space travel.*

#### ROMINA RODRIGUEZ

- Junior, Civil and Environmental Engineering
- Academic Interests: Thermal Science; Energy Conservation and Management
- Activities: Tutor at Emery High School; member and chapter officer, Hispanic Engineers and Scientists and Society of Hispanic Professional Engineers
- Honors: Hispanic Scholarship Fund Scholar
- Educational and Career Goals:  
*Short term:* Enter into a Ph.D. program in Engineering  
*Long term:* Work for a research company dealing with energy management such as the Department of Energy (DOE)

#### XIORANNY LINARES

- Senior, Mechanical Engineering
- Academic Interests: Nano-Technology, Thermodynamic, Dynamic Systems, and Material Science
- Activities: Engineering Intern at Lawrence Berkeley National Lab; Tutor; Women in Science and Engineering (WISE); Hispanic Engineers and Scientists
- Honors: Foster City Rotary Club Grand Scholarship; Engineering Department scholarship; Silicon Valley Engineering Award; Research Scholar, CAMP-NSF
- Educational and Career Goals:  
*Short term:* Engineering project in South America, internship, work for awhile  
*Long term:* Go on to graduate school with the intent of becoming a professor

#### SARA VALDEZ

- Senior, Mechanical Engineering
- Academic Interests: Combustion and Dynamics
- Activities: Research Intern, Berkeley Micromechanical Analysis and Design group; President, Berkeley Chapter, Society of Hispanic Professional Engineers
- Honors: UC Berkeley CAMP-NSF Leadership Excellence Award
- Educational and Career Goals:  
*Short term:* Graduate School in Engineering  
*Long term:* Obtain Ph.D. and conduct research and development as part of a firm working on energy conservation

# CAMP Spotlight: UC Davis

## UC DAVIS STEM TRANSFER DAY

### *Transfer Students Learn About Opportunities*

UC Davis STEM Transfer Day, held November 7, 2008, was a successful campus-wide collaboration that included the support of CAMP and its CAMP Scholars. Students, along with their faculty advisors, were recruited from northern California Community College MESA programs to interact with UC Davis students and faculty, and learn more about the opportunities that await their transfer. The day-long event included the participation of more than 90 attendees from 11 colleges.

**UC Davis CAMP Scholars** presented a poster session on their various research projects, served on student panels and as guides on tours of campus

research facilities. They also networked during lunch, highlighting their experiences at UC Davis, their participation in various CAMP supported research programs, and the leadership opportunities and peer support attained through the student organizations such as CALESS (Chicano and Latino Engineers and Scientists Society) and BEA (Black Engineers Association). Student participant evaluations indicated the event increased the strong likelihood of students applying to UC Davis by 34% and instilled a strong understanding of the opportunities available to them after transfer.

## GRACIELA CRUZ, UC DAVIS CIVIL ENGINEERING

### *Graduating Senior is Award Winning Student Leader*



**Graciela Cruz**, senior in Civil Engineering, expects to graduate June 2009 with a B.S. degree in Civil Engineering. Her contributions to the campus and to her peers as well as her scholarly accomplishments distinguish Cruz on the Davis campus. She is President, Chicano and Latino Engineers and

Scientists Society, and a member of the UC Davis Women's Water Polo Club. In addition to being a student-athlete, Cruz is a recognized accomplished undergraduate researcher. She received the 2008 SACNAS Outstanding Contribution and Research Presentation in Engineering Award.

Cruz has conducted research both at UC Davis and UC Santa Barbara. She continues working on "Characterizing the Green House Gas Emission Potential of Second Hand Appliance Market," a project which she had presented at the 2008 CAMP Statewide Undergraduate Research Symposium at UC Irvine — and for which she received a Special Merit in Research Award. Her mentor is Dr. Debbie Niemeier, whom Cruz acknowledges as being very supportive. Cruz plans to attend graduate school at UC Davis, with a focus on Transportation Studies. She has interest in transportation policy, energy and environmental aspects of transportation, and air pollution.

In addition to membership in SACNAS, Cruz is a member of Mexican American Engineers and Scientists and the Society of Hispanic Professional Engineers. She is also a UC LEADS Scholar.

#### DAVIS NEWSBITE:

**Raquel Orozco** and **Israel Lopez**, third year doctoral students and BD fellows, traveled to Europe Summer 2008 to present their research in engineering. Orozco presented in Moscow, Russia at the International Conference on Colloid Chemistry and Physicochemical Mechanics. Lopez presented at the Seventh International Workshop on Special Health Monitoring, in Poland. The UCD College of Engineering sponsored their travel.



# CAMP Spotlight: UC Irvine

## CHRISTINA NEINO, UC IRVINE CHEMISTRY AND BIOLOGY

### Future Environmental Chemist Sets Sights on the Ph.D.

UC Irvine junior **Christina Neino** has already built a distinguished portfolio that will open doors to future success. A double major in chemistry and biology, Neino began her university career by participating in the CAMP Summer Scholars Program, learning the ropes from Dr. Donald Blake, in the Rowland Hall laboratory in which Dr. F. Sherwood Rowland made historic discoveries that led to the Nobel prize in chemistry. Dr. Blake shares the same research group with Dr. Rowland, and all graduate students. Since 1988 the Blake-Rowland group has been involved in NASA and NSF sponsored airborne projects around the globe.

For an aspiring environmental chemist, there is no more exciting and relevant place to learn atmospheric chemistry, and she has learned about chemical models of the atmosphere from world renowned scientists. Under the mentorship of Dr. Blake, Neino has had the opportunity to develop various analytical and interpretative techniques, such as analyzing chromatograms and operating the gas chromatography equipment. Blake appreciates her motivation and drive.

Neino began actively pursuing research as a sophomore

– and seeking opportunities to present her findings, including oral presentations at the American Chemical Society (ACS) and the American Association for the Advancement of Science (AAAS) meetings as well as at the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS).



Yet, for the long hours she spends studying and working in the lab, she finds time to help others and contribute to their success.

Neino tutors for the CAMP-UCI program in subjects ranging from organic chemistry and general biology to ecology and genetics. Additionally, she volunteers for undergraduate panels, such as for CAMP orientation day for newly enrolled freshmen, and for Girls, Inc., a local organiza-

## DONALD R. BLAKE

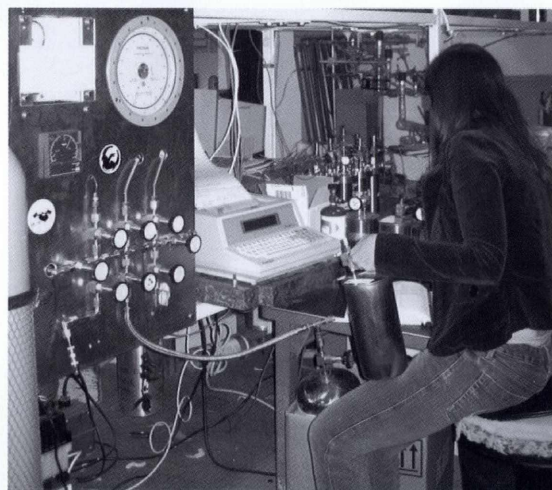
### FACULTY MENTOR BIO

- Ph.D., University of California, Irvine
- B.S., University of California, Los Angeles
- Research Interests: Atmospheric Chemistry
- Academic Distinctions: Outstanding Professor Alpha Phi Society, NASA Group Achievement Award, UCI Chemistry Department Outstanding Teaching Award
- Research: Blake's research group identifies and quantifies atmospheric gases in remote locations throughout the Pacific region from Alaska to New Zealand; and China and Greenland. The group investigates highly polluted cities throughout the world, including Mexico City and Hong Kong, among others, and areas with special conditions, such as burning forests and/or agricultural wastes, or the marine boundary layer in oceanic locations with high biological emissions. Whole air samples are collected on land, ships, and aircraft and are returned to the laboratory for analysis. For an extensive list of publications, visit [www.chem.uci.edu/people/faculty/drblake](http://www.chem.uci.edu/people/faculty/drblake).



*“Christina is bright, pleasant, a real leader and a problem solver.”*

—Dr. Donald Blake, Professor and Chair, Department of Chemistry, University of California, Irvine



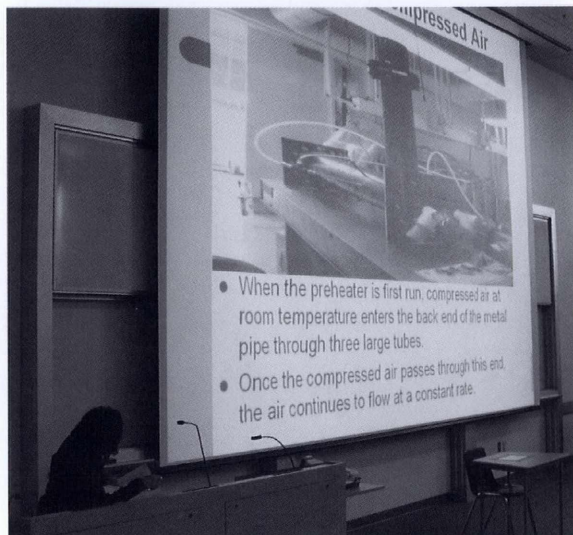
tion dedicated to the advancement of women through educational attainment. Off campus she gives her time to the Flying Samaritans Club, which provides health care for the indigent people of Mexico at the El Testero Clinic. The group travels monthly to provide services at the clinic. She also works at a local pharmacy as a technician. Whether engaged in academic or community service, she is on task and advancing in her undergraduate experience 100% of the time.

Her goal is to obtain a Ph.D. in Environmental Chemistry.

## UC IRVINE SUMMER SCIENCE SCHOLARS

### Students Present Research at September Symposium

September 23-24, 2008 gave some UC Irvine students chills. It was the "big day," the time to present summer research conducted over ten weeks of summer under the watchful eye of faculty mentors and graduate students supervising the laboratory.

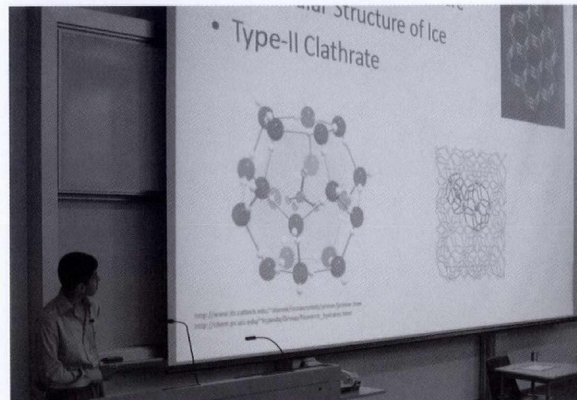


It was a day of anxiety followed by relief after a job well done. Thirty-two undergraduates presented posters in the two-day event at Donald Bren Hall, a transformative experience that was soon duly recorded on student resumes and etched in their minds.

The force behind the summer science scholars is Kika Friend, CAMP Coordinator. Kika has served

as the core and the catalyst for CAMP-UCI since 1997. She has supported UCI students, however, since 1992. Under her guiding hand, students are groomed through the Summer Science Academy to enter the national stage. Her work received national attention when she received the SACNAS Professional Mentor Award.

Derek Dunn-Rankin, Professor of Mechanical and Aerospace Engineering serves as UCI CAMP Faculty Director and Statewide Co-Project Director. He mentored several of the summer scholars who presented. In his welcome remarks, Dunn-Rankin recognized the significance of the moment, and the impact that research has on students' academic goals and decisions for graduate education. His paper, "Undergraduate Research and Faculty Mentoring," appeared in the 2006 CAMP Proceedings. Dunn-Rankin's current research focuses on clean burning coal.



*Following are the Summer 2008 CAMP Presenters, along with their majors, mentors, and title of research. They are candidates for future opportunities and further professional development along the path to their degree goals and aspirations as future scientists and engineers.*

#### **JOSUE ALFARO**

- Physics
- Mentor: Dr. Isabella Velicogna, Earth System Science
- GREENLAND ICE MASS SEASONAL VARIABILITY

#### **GLORIA ANEBERE**

- Chemical Engineering
- Mentor: Dr. Ali Moharz, Biochemistry
- THE SYNTHESIS AND CHARACTERIZATION OF FLUORESCENT SILICA COLLOIDS

#### **FRANK AVEDO**

- Physics & Aerospace Engineering
- Mentor: Dr. James Bullock, Physics

- THE SEARCH FOR DWARF GALAXIES POSING AS GLOBULAR CLUSTERS

#### **A. MELISSA BENITEZ**

- Earth and Environmental Science
- Mentor: Dr. Susan Trumbore, Earth System Science
- CARBON CYCLING IN CALIFORNIA TURFGRASS ECOSYSTEMS

#### **NERY CHAPETON-LAMAS**

- Computer Science Engineering
- Mentor: Mr. Aaron Soto, Deztech Consulting, LLC
- RSS EMAIL SIGNATURES

#### **VANESSA CORRALES**

- Biomedical & Mechanical Engineering
- Mentor: Dr. Mark Bachman,

Electrical & Computer Engineering

- WIRELESS BALANCE SENSOR FOR MONITORING AND ASSISTING DURING MOVEMENT

#### **JORGE DE PAZ**

- Computer Science Engineering
- Mentor: Dr. Jim Randerson, Earth System Science
- AUTOMATED CLASSIFICATION OF THE INTERTROPICAL CONVERGENCE ZONE USING MARKOV RANDOM FIELDS

#### **AUDREY DESMUKE**

- Civil Engineering
- Mentor: Dr. Scott Samuelsen, Civil Engineering

- PARADIGM SHIFT IN THE CONTRIBUTION OF RENEWABLE SOURCES TO THE PRODUCTION OF ELECTRICITY IN CALIFORNIA

#### ALLENE FONSECA

- Public Health Sciences
- Mentor: Dr. David Camerini, Molecular Biology & Biological Chemistry
- GENERATION OF INDUCED PLURIPOTENT STEM CELLS BY PROTEIN TRANSFER

#### ANGIE HARRIS

- Civil Engineering
- Mentor: Dr. Farzin Zareian, Civil & Environmental Engineering
- DESIGN DECISION SUPPORT SYSTEM FOR PERFORMANCE-BASED EARTHQUAKE ENGINEERING

#### RICARDO KOMAI

- Materials Science/Mechanical Engineering
- Mentor: Dr. Farghali Mohammed, Material Science Engineering
- INVESTIGATION OF BOUNDARY SLIDING DURING DEFORMATION OF NANOCRYSTALLINE METALS

#### FRANK JIMENEZ

- Mechanical Engineering
- Mentor: Dr. Farghali Mohamed, Material Science Engineering
- EFFECTS OF HEAT TREATMENT CONDITIONS ON CREEP RESISTANCE OF ELECTRODEPOSITED NANOCRYSTALLINE NICKEL

#### CHRISTINA NEINO

- Chemistry
- Mentor: Dr. Eric Saltzman, Earth System Science
- MEASUREMENT OF ATMOSPHERIC NF<sub>3</sub>, A POTENTIALLY IMPORTANT GREENHOUSE GAS

#### ANDRE PAREDES

- Biological Sciences
- Mentor: Dr. Elliot Botvinick, Beckman Laser Institute
- VATERITE CRYSTALS IN LASER TWEEZER MICRORHEOLOGY

#### ELIZABETH PARTIDA

- Biological Sciences
- Mentor: Dr. Aileen Anderson, Immunology
- THE EFFECT OF C6 DEFICIENCY FOLLOWING A MILD-MODERATE CONTUSION SPINAL CORD INJURY

#### TIMOTHY THATCHER

- Physics
- Mentor: Dr. Michael Dennin, Physics
- RESPONSE OF FOAM TO LOW AMPLITUDE OSCILLATORY SHEAR

#### SANDRA PEREZ

- Chemistry
- Mentor: Dr. Stanley Tyler, Earth System Science
- LANDFILL CH<sub>4</sub> EMISSIONS

#### JACQUE PRENGER

- Biological Sciences

- Mentor: Dr. Frances Leslie, Pharmacology
- DOES THE NATURAL TOBACCO CONSTITUENT NORHARMANE MODIFY NICOTINE REWARD?

#### JOEL RIVERA

- Chemistry
- Mentor: Dr. Ken Janda, Chemistry
- EFFECTS OF DIFLUOROMETHANE ON PROPANE CLATHRATE FORMATION

#### FRANCIS RODRIGUEZ

- Environmental Engineering
- Mentor: Dr. Bill Cooper, Civil & Environmental Engineering
- BYPRODUCT DETERMINATION OF PHARMACEUTICAL ANTIDEPRESSANT COMPOUNDS FOUND IN WASTEWATER EFFLUENT

#### HELEN SANCHEZ

- Chemical Engineering
- Mentor: Dr. Stanley Grant, Environmental Engineering
- SIZE DISTRIBUTION AND SEDIMENTATION RATE OF SUSPENDED PARTICLES IN WASTEWATER STABILIZATION WETLAND

#### CESAR SUL

- Physics
- Mentor: Dr. Gudrun Magnusdottir, Earth System Science

2008 CAMP Symposium  
Presenters continues on page 35

## EXCEPTIONAL PROFESSIONAL DEVELOPMENT EXPERIENCE

### UC Irvine Students Attend Light of Evolution III: Two Centuries of Darwin

A special invitation to CAMP-UCI students to attend The Light of Evolution III: Two Centuries of Darwin provided a unique opportunity to meet biologists from around the world. Hosted by the Arthur M. Sackler Colloquia of the National Academy of Sciences, the symposium attracted renowned national and international biologists in honor of Charles Darwin's 150th anniversary. The CAMP Program Director Kika Friend collaborated with Professor Francisco Ayala to register ten students who had the opportunity to interact with speakers

and faculty at the prestigious event held January 16 and 17, 2009, organized by John C. Avise and Francisco J. Ayala. Ayala is a distinguished evolutionary biologist, and former president of the American Association for the Advancement of Science. He is quoted in the February 2009 issue of *Smithsonian Magazine*, "What Darwin Didn't Know." First published in 1859, *On the Origin of Species* remains scientifically relevant.

The conference provided an exceptional professional development experience for: **Hernan Acevedo**, Junior,

Electrical Engineering; **Gildardo Barron**, Senior, Biological Sciences; **Rodrigo Blancarte**, Sophomore, Biological Sciences; **Gilberto Cardenas**, Senior, Mathematics; **Abigail East**, Junior, Political Science; **Carlos Gaona**, Junior, Mathematics; **Ariadna Jimenez**, Senior, Biological Sciences; **Suzette Lavine**, Senior, Biological Sciences; **Ariana Marti-nez**, Sophomore, Biological Sciences; and **Rebecka Zepeda**, Sophomore, Biomedical Engineering.

### ERIN JIMENEZ, EKEOMA NWADIBIA AND MAYLEN PEREZ, UCLA *Science Students Broaden Horizons in Summer Research Opportunities*

**Erin Jimenez** (Molecular, Cell and Developmental Biology) participated in an undergraduate research program in the Watson School of Biological Sciences at Cold Spring Harbor (New York) Laboratory during the summer of 2008. Under the guidance of Dr. Robyn Johnston in Dr. Dave Jackson's Lab, Jimenez studied the mechanisms that determine phyllotaxy in *abphyl1* and *abphyl2*, maize mutants. In addition, she worked to further define the position of the *abphyl2* gene by positional cloning.



*Erin Jimenez, right, with UCLA lab mentor Dr. Susan Walsh.*

**Ekeoma Nwadibia** (Chemistry), and spent six weeks in summer 2008 in Upton, New York, at the Brookhaven National Labs with chemist Dr. Diane Cabelli. She studies various chemical properties of the enzyme superoxide dismutase (SOD). Nwadibia reports, "I got to work on a different part of SOD research than I usually do. I got the opportunity to learn pulse radiolysis, a technique which uses a



*Maylen Perez, far right, with REU team.*

machine called a van de Graff to generate superoxide radicals. It's a method used to measure the activity of SOD, and indirectly measure its inactivation."

**Maylen Perez** (Marine Biology) conducted research with an REU summer research program in Rio Grand, Puerto Rico. Her lab mentors were Dr. Jorge Ortiz and Debora Figueroa and they worked out of the El Verde Field Station in the Caribbean National Forest. Her project involved evaluating the quality of dissolved organic carbon (DOC) in two tropical streams that receive water waste treatment plant effluent. The research was used to see how the quality of the carbon changes after the addition of effluent so that a determination could be made about the effects of urbanization on the trophic structure of the river systems.

*The Research Experiences for Undergraduates (REU) program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program.*

# CAMP Spotlight: UC Riverside

## UC RIVERSIDE SUMMER RESEARCH SCHOLARS

### STEM Majors Conduct Hands-On Laboratory Research

CAMP-UC Riverside supported students in a variety of STEM majors to conduct hands-on research in Summer 2008. **Dr. Christopher Olivera**, CAMP Coordinator, facilitated the laboratory placements. Faculty mentors guided students in adapting to the culture of the laboratory and taking their place in the research team. They encouraged skills development along with academic growth in the discipline, and exposed them to important trends and data

points as well as data interpretation. The students presented their research during a one day conference at UCR.

Dr. Olivera would like to recognize Vicente Nunez, Briana Rice, and Tori Owens, who are significant contributors to CAMP. The three undergraduates serve as officers and organizers for student meetings and activities. Rice was a Special Merit in Research awardee, Life Sciences, at the 2008 CAMP Statewide Symposium.

#### UGUCHI AZUBUIKE

- Faculty Mentor: Cheryl Hayashi
- Research Title: *Better Understanding Embiid Silk*. Ugochi Azubuike, Matthew Collin and Cheryl Hayashi, Department of Biology.

#### DARCY DUBINSKY

- Faculty Mentor: Margarita Curras-Collazo
- Research Title: *Effects of Polychlorinated Biphenyls (PCBs) and Polybrominated Diphenyl Ethers (PBDEs) on NADPH-diaphorase Staining in Live Supraoptic Nucleus (SON)*. Darcy Dubinsky and Margarita Curras-Collazo, Department of Neuroscience.

#### GEORGE KNIGHT

- Faculty Mentor: Marko Princevac
- Research Title: *Field Investigation of Air Quality Impact of Distributed Power Generators*. George Knight, Bryan Proctor, Hansheng Pan and Marko Princevac, Department of Mechanical Engineering.

#### VICENTE NUNEZ

- Faculty Mentor: Jiayu Liao
- Research Title: *Cloning of SENP2 Into Mammalian and Bacterial Expression Vectors for Monitoring Interactions Between SENP2 and SUMO1*. Vicente Nuñez and Jiayu Liao, Department of Bioengineering.

#### TORI A. OWENS

- Faculty Mentor: Richard Cardullo
- Research Title: *Sea Urchin Egg Jelly pH Study: Acidic or Basic?* Tori Alexandra Owens and Richard Cardullo, Department of Biology

#### BRIANA RICE

- Faculty Mentor: Morris Maduro
- Research Title: *An EMS Screen for Visible Mutations in the Nematode Species – 9JU1325*. Briana Rice, Gina Briotman-Maduro and Morris Maduro, Department of Biology.

#### PRINCE SASIS

- Faculty Mentor: Venugopala Gonehal
- Research Title: *The Retinoblastoma-*

*Related (RBR) Gene Regulates Stem Cell Maintenance In Arabidopsis Shoot Apical Meristem (SAM)*. Prince Sasis and Venugopala Reddy Gonehal, Department of Botany and Plant Sciences.

#### MUSA USMAN

- Faculty Mentor: Joseph Norbeck
- Research Title: *Steam Hydrogasification of Coal-Wood Mixtures Slurries in a Kiln Reactor*. Musa Usman, Arun S.K. Raju, Chan S. Park and Joseph M. Norbeck, College of Engineering, Center for Environmental Research and Technology (CE-CERT).

#### CHRISTOPHER WEBB

- Faculty Mentor: Guillermo Aguilar
- Research Title: *Transdermal Drug Delivery Using Microneedle-Based Devices*. Christopher G. Webb, Feng Sun and Guillermo Aguilar, Department of Mechanical Engineering.

## JAVIER GARAY, ASSISTANT PROFESSOR, MECHANICAL ENGINEERING

### From Engineering Major at UCD to Engineering Professor at UCR



**Javier Garay** received his Ph.D. in Materials Science and Engineering from UC Davis in 2004. He also had a specialization in Solid State Physics. During his doctoral research, Dr. Garay collaborated with scientists at the Lawrence Livermore National Laboratory.

Today he is on the faculty at UC Riverside. Dr. Garay is involved in the production of advanced multifunctional materials including nanomaterials, ceramic composites and intermetallics through

powder consolidation and current activated techniques. He earned a B.S. and M.S. in Mechanical/Materials Science Engineering in 1999 and 2002, respectively, at UC Davis

During his undergraduate education, Dr. Garay was supported to conduct summer research through CAMP/MORE (Mentorships & Opportunities for Research in Engineering). His research, Design of Functionally Graded Materials Using Self Propagating High Temperature Synthesis, under the supervision of Professor Zuhair Munir, shaped the foundation for doctoral studies, and ultimately the professoriate.

*Javier Garay continues on page 33*

## CAMP Spotlight: UC San Diego

### CAROLINA MARGARITO, UC SAN DIEGO STRUCTURAL ENGINEERING *Multitalented Musician and Future Engineer*

UC San Diego structural engineering major **Carolina Margarito** is an efficient multitasker. In her own words, she is very good at “working under pressure to accomplish overall objectives.” One of her goals is to complete her bachelor’s degree in June 2009 and continue on to the Ph.D. She has considerable experience as an intern at the California Department of Transportation, where she has assisted in numerous areas, since Summer 2006. For example, she has assisted in drafting project plans, cross-sections and slope stake notes for plans, specifications, and estimates, and she has participated in project management areas such as work plans and exhibits. She has had the opportunity to learn design and construction and “best of all: reasoning and ‘engineering judgment’.”

Margarito is a member of the American Society of Civil Engineers, the Society of Civil and Structural Engineers, and the student chapter of the Society of Hispanic Professional Engineers, for which she has served as treasurer. But she also has another side: passionate violinist. Margarito plays in the UCSD Chamber Orchestra and in the UCSD Ensemble Con Brio. She also plays in her church youth group band. Her proactive stance in a wide array of activities earned her Term Provost’s Honors as well as the Student Organizations and Leadership Opportunities Award.

With her plans to pursue the doctorate in engineering, she says, “I look forward to taking my educational experience to a whole new level.”



#### CAROLINA MARGARITO: FIRST PERSON

“Right from the day I began my engineering curriculum, I was made aware that many people do many things differently in distinct parts of the world; that is why we have the seven wonders of the world spread out all across the globe. Engineering is one such beautiful subject that we have to learn the best way to do things and the only way, I believe, is to learn from different and genuine sources. One such way was joining Caltrans as a Student Intern. I take immense pleasure in working at Caltrans.

From a building foundation to a multistoried skyscraper, we can find examples of what structural engineers can accomplish. I strongly believe that building safer structures for mobility or even a dwelling is imperative, for this eventually affects the community we live in. Thus, I strive to learn more and educate myself from what UCSD has to offer in shaping myself as an expert in structural engineering. I plan to do this by obtaining a doctorate degree with specialization in earthquake engineering.”

- Education: Jacobs School of Engineering, UCSD, June 2009, B.S. Structural Engineering
- Objective: To become an expert in structural engineering
- Experience: Caltrans Student Intern
- Personal attributes: Goal-driven achiever with strong organizational skills
- Academic recognition: National Society of Collegiate Scholars
- Long term goal: Ph.D., Structural Engineering

*“I look forward to taking my educational experience to a whole new level.”*

## BRANDON REYNANTE, UC SAN DIEGO MECHANICAL ENGINEERING

### President of Tau Beta Pi & First Place Winner, EUREKA!

Mechanical Engineering major (and graduating senior) **Brandon Reynante** took first place at the 2008 Engineering Undergraduate Research Conference & Assembly (EUREKA), at the UC San Diego Jacobs School of Engineering. Reynante prepared a poster and a short oral presentation on his topic, Scaling Carbon Nanotubes for Commercial Application. Student work was judged by the engineering faculty and associate deans. Reynante's advisor is Dr. Kenneth Vecchio, Professor and Chair of the newly established NanoEngineering Department.

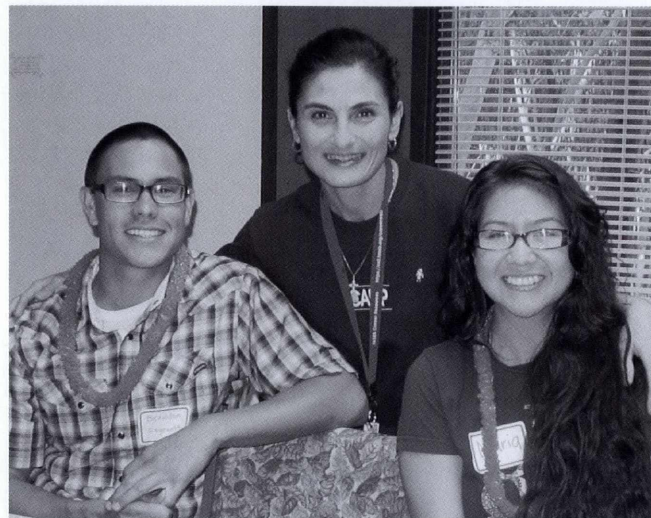
Reynante has a 3.95 overall gpa. His leadership and scholarship at UCSD is well documented in his resume, which would make any future engineer highly competitive for the professional workplace or graduate school. Reynante has honed his leadership skills through membership in the American Institute for Aeronautics and Astronautics, the Cystic Fibrosis Foundation, and Habitat for Humanity. He was elected President of Tau Beta Pi, the Engineering Honor Society, at UCSD for the 2008-09 academic year. He had previously served as the society's outreach coordinator. Additionally, he is a National Tau Beta Pi Dodson Scholar.

Honors received emphasize Reynante's scholarship: Provost's Honors; Chancellor's Research Scholar; Computer Science, Engineering & Mathematics Scholar; National Action Council for Minorities in Engineering Scholar; and Undergraduate Research Fellow, California Institute of Technology (aka CalTech).

Reynante's work experience is closely related to his major, including research assistant at the Synthesis & Processing

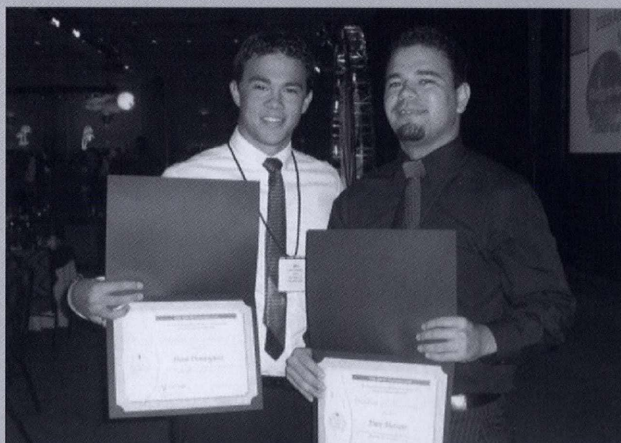
of Advanced Materials Laboratory at UCSD. Service activities include serving as a teaching assistant for the Education Studies Department.

From the scope and depth of his undergraduate experience, Reynante has maximized all available opportunities—and then some. He has shaped his future through a strong work ethic balanced by personal responsibility and service, and is destined to make a difference.



*Brandon Reynante with CAMP Coordinator Dr. Jacqueline Azize-Brewer and fellow student Maria Zimmerman, at a Study Break Dinner.*

## SAN DIEGO NEWSBITES:



**UC San Diego students won awards** at the Annual Biomedical Research Conference for Minority Students (ABRCMS), in Orlando, FL, November 2008. **Dana Dominguez** won for his oral presentation in the physiological science category, and **Dave Marzan** won for his poster presentation in neuroscience. ABRCMS is the

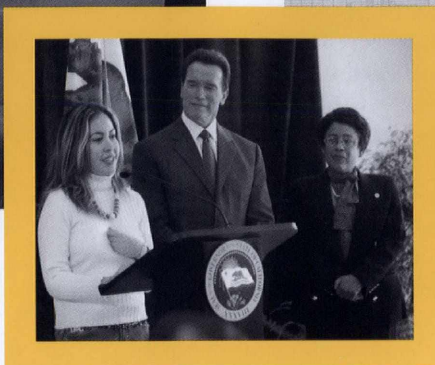
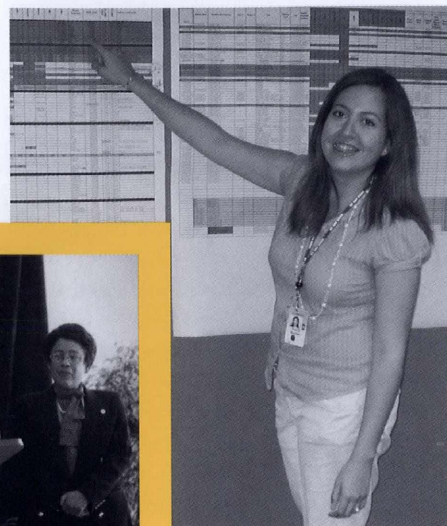
largest multidisciplinary conference in the U.S., and attracted 2,600 attendees and more than 1,000 abstracts.

**Robert Valtierra** enrolled in the Ph.D. program in Mechanical Engineering at Boston University. He has started his second semester. He graduated with a B.S. degree in Structural Engineering in June 2008.

**UC San Diego Structural Engineering majors Carolina Margarito, Jorge Ortiz, and Ruben Soto** won First Place in the Fifth Annual National Seismic Design Competition in New Orleans, Feb. 9, 2008.

They competed with undergraduates from 16 institutions nationwide. The students constructed a balsa-wood structure that would perform well under the 1940 El Centro, the 1994 Northridge, and the 1995 Kobe Earthquake simulations. The students are profiled in this issue.





**EVA GABRIELA "GABY"  
BAYLON, UC SAN DIEGO  
MECHANICAL ENGINEERING**

## ***Student Leader Builds Strong Foundation***

**Eva Gabriela "Gaby" Baylon** is a professional engineer in the making. An honors transfer student from San Diego City College to UC San Diego, Baylon has taken every opportunity to build a future in engineering. From an internship with Boeing in Washington State to leadership training in Washington, D.C., the mechanical engineering major has pursued a challenging and rewarding path to build academic credentials and professionalism.

Baylon is on a personal mission of attainment and excellence in the engineering field. She is involved with the Society of Hispanic Professional Engineers (SHPE), for which she serves as Student Chapter President and Region 2 Vice Regional Student Representative. In 2006, while in community college, Baylon was selected as SHPE San Diego Outstanding Student President. In 2008, she won a scholarship from the Hispanic Engineering National Achievement Awards Conference (HENAAC in collaboration with Lockheed Martin) as well as designation of Scholar of the Week.

Materials science interests her most. Although she hasn't entertained thoughts of a "dream career," definitely knows what she doesn't want. She says, "I do not want a job where I have to sit at a desk all day long." Baylon likes interacting with people. She would like to have a career that allows her to work with people in other fields as well as her own. "I like doing presentations, and discussing the results." Results are something she achieves on a regular basis, whether conducting research in engineering

design (using AutoCAD and Autodesk Inventor) or analyzing structural airplane components, as she had done for Boeing, analyzing components of the 747-8F.

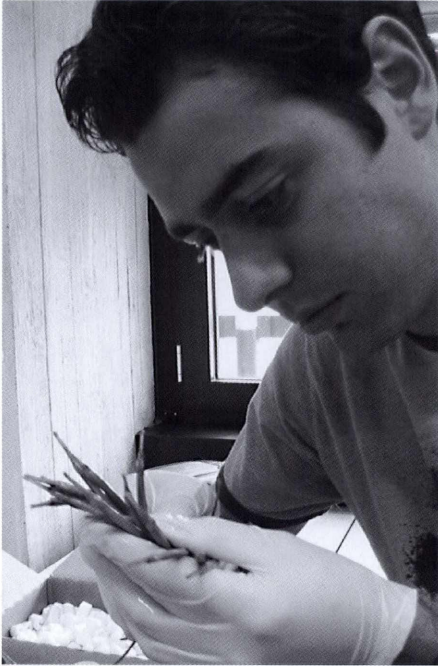
Baylon has a 3.8 gpa, and has been recognized for her talents and pursuits, her grit and her tenacity. Of note was her selection as the student speaker at Governor Schwarzenegger's historic visit to San Diego City College. She spoke about the benefits of attending community college and the many leadership opportunities available. Additionally, Baylon took the spotlight in Washington, D.C., at a scholarship ceremony held at the U.S. Capitol.

One of her most visible attributes is her commitment to success—to others as well as her own tendency to keep raising the bar. She tutors her peers in design shop tools and procedures, especially AutoCAD. Recently she was selected as a 2008-09 McNair Scholar, a program closely affiliated with CAMP on several UCs, and especially at San Diego, given the proximity of program staff. In the McNair program Baylon will experience additional graduate preparation and professional development. She is a role model for engineering majors, and for women in particular.

Her advice? "Don't be disappointed when you face obstacles. The easiest thing is to give up, but the most rewarding feeling comes when you overcome an obstacle that could have stopped you."

Baylon advises future engineers to look for a mentor, "someone who cares about your progress."





**ERIC GARCIA, UC SAN DIEGO  
ECOLOGY, BEHAVIOR AND EVOLUTION  
CAMP SUMMER SCHOLAR**

***Unforgettable Experience in Switzerland***

**Eric Garcia**, UC San Diego senior majoring in Ecology, Behavior and Evolution, experienced summer research that exceeded all expectations. Garcia relates that he feels “extremely proud and also grateful for being able to accomplish such unique research” at the University of Zurich-Irchel, Switzerland. He says that everything went very well, “from acceptance of the proposed project to the sequencing of formalin-fixed pipefish in Switzerland.”

Under the mentorship of Dr. Tony Wilson, Department of Zoological Museum, Garcia produced a paper, *Interspecific Hybridization as a Source of Genetic Variation in Eastern Pacific Syngnathus species*.

Garcia shared academic and social benefits of the international experience. He reports, “Academically, this research contributed several remarkable benefits toward my education and future goals.” He learned “many indispensable” laboratory and research skills which made him a “more aware and analytic student.”

The UC San Diego CAMP Science Program, under the leadership of Dr. Jacqueline Azize-Brewer, facilitated Garcia’s summer internship. The hands-on participation also bolstered his enthusiasm and commitment to become an “active and efficient” researcher in biological sciences. He also formed strong collegial ties with lab partners. The social aspects were equally important. Garcia says he enjoyed “mingling with multinational people, sharing backgrounds and learning from everyone else’s culture.” He feels honored to have worked with scientists on two continents.

Garcia transferred to UCSD from the College of the Desert, Palm Desert, CA, and is on track for graduate school. He plans to pursue a Ph.D. in marine biology or related field and perform research on marine organisms or marine ecosystems.

**SAN DIEGO NEWSBITES:**

**Congratulations to Luis Guerrero**, UC San Diego Class of 2007, on admission to the Ph.D. program in Mathematics at UC Santa Barbara. Luis was a 2006 recipient of the CAMP Special Merit in Research Award for “Exploration of Khovanov Homology and Link Cobordisms.” He was also the winner of “Who Wants To Be a Mathematician?” at SACNAS 2006, with a \$2,000 prize from the American Mathematical Society.

**UCSD Bridge to the Doctorate Fellow Moses Tataw** (Cohort III), has received a five-year IGERT Fellowship through the **Department of Computer Science at UC Riverside**. Tataw completed his first two years of graduate study at the San Diego campus and continues his doctoral work at UC Riverside, where he is studying chemical genomics. Tataw earned a B.S. in computer science at UC Riverside, and an M.S. in computer science and engineering at UC San Diego.

## RUBEN SOTO AND JORGE ORTIZ, UC SAN DIEGO

### Structural Engineers on the Rise

**Ruben Soto** and **Jorge Ortiz** are June 2008 graduates of UC San Diego, both having earned B.S. degrees in Structural Engineering, who have much in common. Soto and Ortiz have made the most of their undergraduate careers not only in academics, but in the professional workplace as engineering student interns and on campus as leaders in student organizations.

Each has also developed technical skills that bolster their competitiveness for jobs in a challenging economy.

Soto and Ortiz formed two of the trio of UCSD students (Carolina Margarito is the third member of the design group, profiled elsewhere in this publication) who won the National Design Competition at the Fifth Annual Seismic Design Competition in New Orleans last year. The team constructed a balsa-wood structure that would perform well under the 1940 El Centro, 1994 Northridge, and 1995 Kobe Earthquake simulations.

Soto has a position as design engineer with Bradow and Johnson engineering firm in Newport Beach, CA. He holds an Engineer-in-Training Certificate and his short term goal is to complete his PE (Professional Engineer) license. Soto also intends to

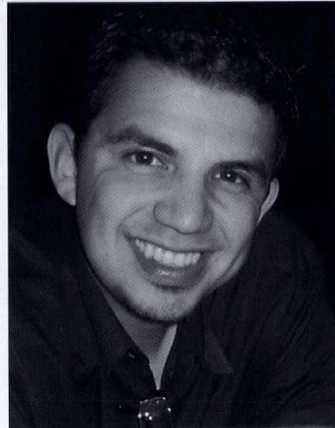
pursue a master's, and to become LEED certified. He has special interest in "green engineering."

Ortiz has also entered the professional workplace, and has an engineering position in Irvine, CA. He has prepared for the challenges ahead through a series of internships, including the City of Modesto, CA, the City of San Diego, CA, and at the California Transportation Department. Leadership includes his service as Vice-National Undergraduate Representative to the Society of Hispanic Professional Engineers, and Transportation Chair for the West Coast Career Expo, 2006. Ortiz's vision led to becoming co-founder and vice president of the International

Association for the Exchange of students for Technical Experience at UCSD. His service includes Junior Advisor for the Hispanic Youth Leadership Council.

The two colleagues have entered the workplace in challenging economic times,

but their pursuit of professional development and sustained achievements have prepared them to be leaders and innovators in any competitive environment. They are destined to advance technology and promote the profession.



*Ruben Soto*



*Jorge Ortiz*

#### RUBEN SOTO HONORS & ACTIVITIES

- First Place EERI/PEER Undergraduate Seismic Competition; Design Team Captain,
- Surveying Team Captain, UCSD Surveying Principles Competition, American Society of Civil Engineers' Southwest Regional Conference
- Student Intern, Yeager Skanska, San Diego (Highway Widening Project)
- Architectural Technician, Marengo Morton Architects, La Jolla, CA
- Engineering Aide, Department of Structural Engineering, UCSD

#### JORGE ORTIZ HONORS & ACTIVITIES

- First Place EERI/PEER Undergraduate Seismic Competition
- Engineering Poster Award at the 2007 SACNAS national conference
- Student Engineer, City of San Diego
- Student Intern, California Transportation Department, San Diego
- Member, National Institute of Leadership Advancement
- Member, American Society of Civil Engineers

## DR. DAVID ARTIS, UC SAN DIEGO RECRUITING AND TRANSFER EFFORTS *Community College Connection: UC San Diego's CC2U*

*"It is our hope that this effort will be especially welcoming to underrepresented, low-income and/ or first-generation students because students from non-college-going backgrounds often take longer to find useful university resources and services."*

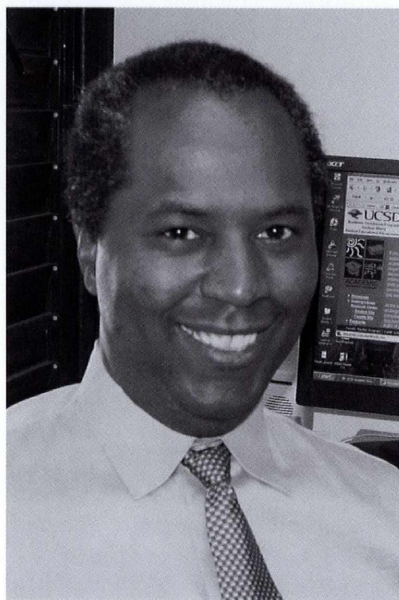
—Dr. David Artis, CAMP Director, UC San Diego

Community College to University—it's a great opportunity for prospective transfer students, and a highly successful initiative forged through interinstitutional partnership and collaboration. The goal is to build a bridge to the university before students transfer, equipping them with a comprehensive view of services available at UC San Diego and the tools for success. The program maintains an interactive website, including blogs and photo gallery as well as opportunities to register for events. **CC2U says: Got questions? We got answers!**

Partner California Community Colleges include Mesa College, San Diego City College, Southwestern College, Miramar College, and Grossmont College. A transfer prep event has been held at each of these sites in 2008, and a full slate of activities is planned for 2009, beginning with an activity at Southwestern College in March 2009.

**Dr. David Artis**, CAMP Director at UC San Diego, is on the frontline of the recruiting and transition efforts. He says, "The CC2U initiative is important because it is a genuine partnership between UCSD and several of the area's community colleges." Dr. Artis adds that the partnership is based on each side's expertise in student development and the shared motivation "to help transfer students achieve the same level of success as their peers."

Dr. Jacqueline Azize-Brewer, CAMP Coordinator, is an active participant in CC2U, and often takes CAMP students along to provide the undergraduate perspective. Dr. Azize-Brewer was a transfer student herself, and fully understands



**Dr. David Artis**

the special circumstances that many underrepresented students face in their path to transfer to a four year university, and to the University of California in particular. At UC San Diego, CC2U partners from Student Affairs and Academic Affairs units include Admissions, Financial Aid, Education Abroad and others. CC2U partners provide new transfer students immediate access to supportive staff members and campus resources in order to assist them with getting started achieving great things at the university. The partnership is significant because it helps students benefit from the experience of their peers, helping them to avoid the pitfalls that many community college students fall into when they transfer to a four-year institution.

### *JAVIER GARAY, Ph.D., continued from page 27*

Dr. Garay is right at home in his office in Bourns Hall on the Riverside campus, working with students. He is the quintessential role model and mentor, giving back to the University in the manner in which he was supported during his undergraduate and graduate career at Davis. Future students will be the beneficiaries of a tradition that he has developed and shaped under collegial relationships with faculty and scientists along the path to his academic appointment.

#### RESEARCH TOPICS

Dr. Garay's research interest is in the broad area of advanced material processing and synthesis with a particular interest in nanocrystalline materials. Processing techniques include electric field assisted material synthesis, spark plasma sintering (SPS) and physical vapor deposition (PVD). He is also interested in fundamental investigations of solid-state processors including mass transport, nucleation, electric current effects and defects in materials. Currently his main research directions are bulk nanocrystalline oxides and nanocomposites for optical, thermoelectric and magnetic applications.

*"I have been delighted to follow the career of this talented young scholar from his beginnings as a CAMP scholar at UC Davis."*

—Dr. James Shackelford, Professor of Materials Science Engineering, College of Engineering, UC Davis

## CAMP Spotlight: UC Santa Barbara

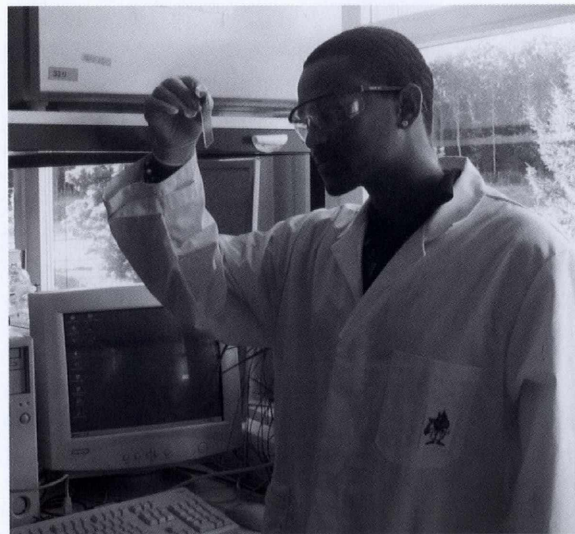
### AMANUEL NEGASH AND RICARDO ALAMILLO, UC SANTA BARBARA *International Research Experience*

UCSB CAMP students **Amanuel Negash** and **Ricardo Alamillo** participated in the Cooperative International Science and Engineering Internships (CISEI) program through the UCSB International Center for Materials Research (ICMR). The CISEI program is a National Science Foundation (NSF) Research Experiences for Undergraduates site that funds travel, housing and living expenses for U.S. undergraduates to complete 10-week summer research internships in interdisciplinary materials science. Participants are individually matched with a research mentor and project at ICMR partner institutes in England, Ireland, Chile, Germany, China and the Netherlands.

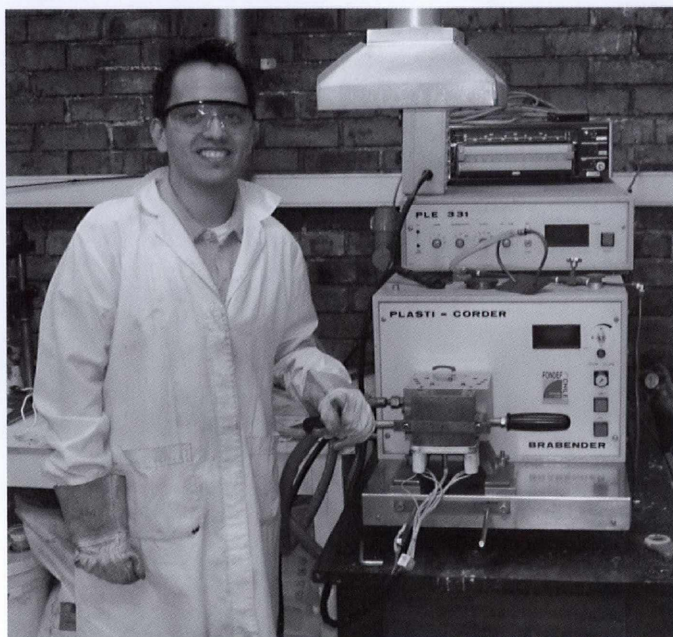
Negash, currently a senior in Mechanical Engineering at UCSB, spent ten weeks at the Leibniz Institute for New Materials in Saarbruecken, Germany, where he completed a research project entitled *Cracking mechanisms in sol-gel silica thin films*.

Alamillo spent ten weeks at the University of Chile in Santiago working in the Department of Chemical Engineering and Biotechnology on a project entitled *Optimization of synthetic procedures of silica and copper based nanoparticles and the effect of particle size on the physical properties of nanocom-*

*posites*. Alamillo is currently a senior in Chemical Engineering at UCSB. He presented his summer internship work at the SACNAS conference in October 2008 and received a special merit award for his poster presentation.



**Amanuel Negash at the Leibniz Institute for New Materials, Saarbruecken, Germany**



**Ricardo Alamillo at the University of Chile, Department of Chemical Engineering and Biotechnology, Santiago, Chile**

*“Amanuel and Ricardo really took advantage of the opportunities they had in Germany and Chile. They both worked hard, which showed in their successful research projects, but also took the time to travel and experience the countries they were living in. I wish all students could have an international research experience and be able to see first hand how different and yet how similar the research culture is around the world.”*

—Dotti Pak, Ph.D.,  
Material Research Laboratory,  
UC Santa Barbara,  
CAMP Co-Coordinator

## AUREA GOMEZ, UC SANTA BARBARA CHEMICAL ENGINEERING CAMP Intern Presents at National Conference

CAMP participant **Aurea Gomez**, a senior at UC Santa Barbara, presented her research at the 2008 National SHPE (Society of Hispanic Professional Engineers) conference November 12-16 in Phoenix, Arizona. The Conference brings together presenters from a variety of engineering backgrounds and is the largest technical and career conference for Hispanics in the country. Gomez presented her internship work, under the supervision of Professor Todd Squires, entitled *Characterization of ferromagnetic disks magnetic momenta and surface properties*. She plans to graduate in June 2009 with a B.S. in Chemical Engineering, and enter the professional workplace.

In addition to her current research activities, Gomez previously was a research assistant in the laboratory of Professor Gui Bazan (2007) studying the synthesis of oligomers, and in the laboratory of Dr. Theofanous and Guangjun Li (2006) in the study of aero breakup.

Gomez has participated in CAMP at UCSB since summer 2006, and presented a poster at the 2008 CAMP Statewide Research Symposium. She is currently the co-chair of the UCSB chapter of Los Ingenieros, for which she coordinated a major outreach activity, Science and Technology Day. The event involved more than 400 middle, high school, and community college students. Her activities also extend to membership in the American Institute of Chemical Engineers. Honors include the Dean's List, a Chevron Scholar-



ship, and paper competition finalist at SHPE in both 2007 and 2008. Despite her academic and professional commitments, Gomez finds time to volunteer as a MESA Engineering Program tutor and as a math tutor at Nipomo Elementary School in Nipomo, California, on the Central Coast.

### 2008 CAMP SYMPOSIUM PRESENTERS continued from page 25

- ARCTIC SEA ICE: TRENDS AND VARIABILITY OVER THE PAST 50 YEARS

#### MARTIN TAJIBOY

- Aerospace Engineering
- Mentor: Dr. John Garman, Aerospace Engineering
- IMPROVEMENTS TO ELECTRICALLY MODIFIED DIFFUSION FLAME

#### RAMON A. ANGUIANO

- Electrical Engineering
- Mentor: Dr. John Garman, Mechanical & Aerospace Engineering
- DEVELOPING A PROBE TO MEASURE CONDUCTANCE IN A DYNAMIC OIL AND WATER EMULSION

#### VIVIANA VILLAREAL

- Aerospace Engineering
- Mentor: Dr. Derek Dunn-Rankin, Mechanical & Aerospace Engineering
- DESIGN OF A DROPLET GENERATOR FOR LIQUID JET BREAKUP OF VISCOELASTIC FLUIDS

#### JULIE COJULUN

- Aerospace Engineering
- Mentor: Dr. Derek Dunn-Rankin, Mechanical & Aerospace Engineering
- AIR PREHEATER FOR TURBINE BURNER

#### BELÉN VASQUEZ

- Aerospace Engineering
- Mentor: Dr. Derek Dunn-Rankin, Mechanical & Aerospace Engineering
- MEASURING AMMONIA SPECTROSCOPICALLY IN SIMULATED COAL COMBUSTION FLUE GAS

#### SAMIYYAH TILLMAN

- Public Health Sciences
- Mentor: Dr. Pam Flodman, Pediatrics
- THE CORRELATION BETWEEN HYPERTENSION IN RATS AND HUMANS

#### ALONZO GARCIA

- Computer Science Engineering
- Mentor: Dr. Scott Jordan,

Information & Computer Science

- DEEP PACKET INSPECTION TECHNIQUES AND DEVICES: THE WAN OPTIMIZATION AND THEIR INTERACTION WITH INTERNET PROTOCOL

#### INDAR SMITH

- Biological Science
- Mentor: Dr. Krishnansu Tewari, Oncology
- EFFECTS OF NICOTINE AND DEVELOPMENT OF ADDICTION IN ADOLESCENT RATS

#### ALEX ARREDONDO

- Mechanical Engineering
- Mentor: Dr. Michael McCarthy, Mechanical & Aerospace Engineering
- PARALLEL COMPUTATION FOR COMPLEX LINKAGE DESIGN

#### JANTAMMY VARGAS

- Biological Sciences
- Mentor: Dr. Eric Saltzman, Earth System Science
- METHYL CHLORIDE IN FIRN AIR FROM SUMMIT, GREENLAND

## CAMP Spotlight: UC Santa Cruz

### ANNUAL BIOMEDICAL RESEARCH CONFERENCE FOR MINORITY STUDENTS *ABRCMS 2008 Well Attended by UC Santa Cruz Undergraduates*

Malika Moutawaikkil Bell, UC Santa Cruz CAMP Program Coordinator, led a contingent of UCSC undergraduates to the Annual Biomedical Research Conference for Minority Students (ABRCMS), held November 2008 in Orlando, Florida. ABRCMS is designed to encourage undergraduate and graduate students to pursue advanced training in the biomedical and behavioral sciences. The Santa Cruz

presence represents significant work on behalf of the faculty and staff in preparing this large of a group to register and present in the appropriate categories. In addition to learning from the networking and research presentations, students had a great time experiencing the amenities of Orlando. (See p. 29 for more CAMP-ers at ABRCMS.)

Three students won recognition for their research presentations: **April Bautista-Gregeron**, who had presented at the 2008 CAMP Statewide Symposium; **Michelle Herrick**, and **Marisela Marinez** (see facing page).

Of interest to graduate school-bound students was the session, "Just what the Ph.D. Ordered: Developing a Strategic Plan for the First 18 Months of your Doctoral Program." Students gained insights from another session entitled "Strategic Thinking Tips for Achieving Academic and Career Success." They also enjoyed the Career Coaching Corner and the meet-and-greet for speakers.





**The Santa Cruz campus and CAMP systemwide network celebrates three awardees:**

**APRIL BAUTISTA-GREGERSON**

- Caitlin Binder, Dr. Bakthan Singaram
- SYNTHESIS OF NOVEL CHIRAL B-AMINO ALCOHOLS AND APPLICATION IN THE ASYMMETRIC DIETHYLZINC REACTION

**MICHELLE HERRICK**

- Yvette M. Vaske, Dr. Joseph Konopelski
- BETA-LACTAM CHEMISTRY FROM AN ALPHA-AMINO ACID

**MARISELA MARINEZ**

- Dr. Rebecca Marlow, Dr. Lindsay Hinck
- THERAPEUTIC POTENTIAL OF THE CHEMOKINE RECEPTOR CXCR4 IN BREAST CANCER

**The following student presenters, received conference travel awards:**

**PEDRO MEDINA**

- Mentors: Dr. Alan Zahler; Dr. Jennifer Kabat, post doctoral fellow

**MARISSA PEREZ**

- Mentor: Dr. Alan Zahler; Nicole Lambert, graduate student mentor

**NATALIE GARCIA**

- Mentors: Dr. Barry Sinervo; Lesley Lancaster, graduate student mentor

**JAIME HERNANDEZ**

- Mentors: Dr. Manel Camps; Dave Alexander, post doctoral fellow

**AN PHAN**

- Mentors: Dr. David Feldheim; Jason Triplett, post doctoral fellow

**OMED S. MUZAFFERY**

- Mentors: Dr. Jin Zhang; Abraham Wolcott, graduate student mentor

## UC Santa Cruz Students Enrolled in Graduate School

UC Santa Cruz announces the following Alumni who are enrolled in graduate or professional school. Thanks to Malika Moutawaikkil Bell for her work as CAMP Coordinator and ongoing efforts in tracking students in their postbaccalaureate programs.

**ERIC ALCID**

- University of Washington, MD/Ph.D. Program

**ERIK ALMARZA**

- UC Irvine, Chemical and Material Physics Ph.D. Program

**BELEM AVILA**

- UC Davis, Chemistry Ph.D. program (M.S. Chemistry, San Francisco State University)

**LAMAR PETTY**

- UC San Francisco, Chemical Biology Ph.D. Program

**IVAN CRUZ**

- University of Washington, Molecular and Cell Development Ph.D. Program

**NORMAN FORSBERG**

- Oregon State University, Environmental and Molecular Toxicology Ph.D. Program

**RAMON GALINDO**

- University of Iowa, Biology Ph.D. program

**JOSE IBERRA**

- UC Davis, Chemistry Ph.D. program (M.S. Chemistry, San Francisco State University)

**MONICA MUNIZ**

- University of Texas Medical Branch, Pharmacology and Toxicology Ph.D program

**ASHLEY SANDERS**

- California State University San Francisco, Molecular and Cell Biology Master's Program

**AMBER SMITH**

- University of Michigan, Biological Sciences Ph.D. Program

**SHEWIT TEKESTE**

- UCLA, Biological Sciences Ph.D. Program

## UC SANTA CRUZ UNDERGRADUATE PROFILES

### NATALIE GARCIA

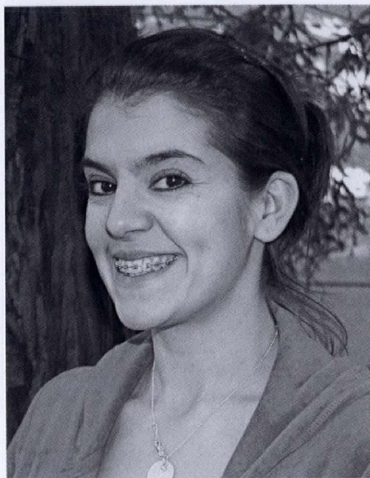
- Senior: Molecular, Cell and Developmental Biology Major
- Long term academic goal: Ph.D. and Postdoc in Biochemistry and Drug Discovery
- Career Goal: Long-Term Career in Biomedical Research
- Best thing about conducting research: Intellectual freedom and hands on application of applying the scientific method.
- Presented at: Annual Biomedical Conference for Minority Students (ABRCMS), Orlando, FL, 2008. At undergraduate research symposium at UC Santa Cruz, June 2008.
- Mentor: Dr. Ted Holman
- Motivation/inspiration in my degree program and in life: Family first. No one in my



family has gotten a Ph.D. or gone into a career in research. Science is so hard, it makes all the work even more rewarding to me. Also, the diversity programs like CAMP and IMSD give me clarity about how important it is to even the playing grounds for everyone in the sciences and higher education.

### MELINDA SOARES

- Junior, Physics
- Long term academic goal: Ph.D. Physics
- Career goal: Scientific educator and researcher
- Best thing about conducting



research: Being a member of a large collaboration of dedicated individuals.

- Presented at: Fermi Collaboration Meeting, 2008
- Mentor: Pablo Saz Parkinson
- Membership in Professional Associations: Fermi Collaboration; Society of Physics Students; California Community College Scholastic Honor Society
- Motivation/inspiration in my degree program and in life: Coming from an educationally disadvantaged background, I have overcome a number of obstacles just to get where I am now. Making the commitment to continue on with my degree while raising a small child was difficult, but my success has shown me that anything is possible in life with a little hard work. I am a role-model for my son and younger sisters and I intend to show them how far one can go if they believe in their dreams.

### JANELLE YONG

- Senior, Electrical Engineering
- Long term academic goal: Ph.D., Electrical Engineering
- Career goal: Anywhere that allows me to be creative in a research environment, be it academically or in the engineering industry.
- Best thing about conducting research: The independence and freedom of setting up my own boundaries for my own experiments.
- Mentor: Joel Kubby
- Presented at: SACNAS



- Professional Association Memberships: Institute of Electrical and Electronics Engineering (IEEE); Society of Women Engineers (SWE); Society of Hispanic Professional Engineers (SHPE)
- Motivation/inspiration in my degree program and in life: I look forward to the opportunities ahead to explore more specific areas within and related to emergent MEMS technology, and to be at the forefront of this ever-changing technology.

*"All 42 of the undergraduates who conduct research funded by our programs visit with me regularly, once or twice a week. I have a little snack shop set up in my office so they often come to talk and eat. I enjoy working with students to make their experiences as rich as possible based on their unique goals and personality. Some of the advice I share is how to speak to faculty and mentors in order to come up with a project that they enjoy."*

—Malika Moutawakkil Bell, CAMP Coordinator, UC Santa Cruz



## Corporate Support

### UC IRVINE AEROSPACE & MECHANICAL ENGINEERING AND COMPUTER SCIENCE

## Students Win Scholarships Through Partnership Between Hispanic Scholarship Fund and Mazda Foundation (USA)

Eight UC Irvine Aerospace & Mechanical Engineering and Computer Science majors won \$2,500 awards from the Mazda North American Foundation in collaboration with the National Hispanic Fund. Students were recognized October 16, 2008, and photographed at the Mazda Showroom in Irvine, California.

Awardees: **Andrew Marquez, Jose Gallegos, Frank Jimenez, Julie Cojulun, Jorge**

**De Paz, Aaron Botello, Nery Chapeton-Lamas, and Martin Tajiboy.** The students were re-awarded for 2009. The awards represent a sustained effort over ten years, in which Mazda shows its support for future engineers—hopefully future employees in the automotive design industry, and fresh perspectives on advancing the automotive industry at home and abroad. Center back row, Kika Friend, UCI CAMP Coordinator; far right, Robin Jeffers, Director of Undergraduate Student Affairs and CODE (Center for Opportunities and Diversity in Engineering). Also pictured is Professor John LaRue, UCI Henry Samueli School of Engineering.



### NICHOLAS D. OLIVAS, UC IRVINE BIOLOGICAL SCIENCES

## “How CAMP Impacted My Life”

I came to UC Irvine in the fall of 2004 with the primary intention of learning science. As I found myself lost amid a seemingly endless university, I turned to CAMP in hopes of receiving much needed mentorship. Throughout my four years as an undergrad at UC Irvine, CAMP has provided me more than mere mentorship; it has provided me with the essential tools necessary to excel in my classes and in the lab, and CAMP has prepared me to enter graduate studies.

Through the CAMP program, I was able to truly appreciate the beauty of science, the beauty that PowerPoint presentations fail to capture. In addition, the CAMP program taught me

how to write scientific papers, create research posters, and how to speak confidently about my research in front of large audiences. As a CAMP Summer Science Scholar in both 2005 and 2006, I was able to present my research at several conferences including the Society for Advancement of Chicanos/Latinos and Native Americans (SACNAS) National Conference as well as the CAMP Statewide Undergraduate Research Symposium. My success at these conferences in addition to the positive interactions made with other undergraduates and professionals facilitated a deeper appreciation for scientific investigation and furthered my understanding for the need for minority rep-

resentation in the scientific community.

As a prospective graduate student, I am certain that I would not be as qualified to enter Ph.D. programs without CAMP. I believe that CAMP fully meets its objective in that the program was able to allow me to be months away from receiving my baccalaureate and weeks away from submitting my graduate school applications. In addition, Kika Friend has taught me the importance of being a minority in the sciences and through her mentorship, I have gained a new appreciation for both my culture, science, and the university as a whole. To better phrase the question at hand, how hasn't CAMP impacted my life?

## CORPORATE SUPPORT: UC-EDISON SCHOLARSHIPS

# University of California, Irvine and Edison International Partnership Supports STEM Transfers

The UC/Edison International Scholarship Program was established in Fall 2000 to offer scholarships to disadvantaged community college transfer students planning to enroll at a UC campus. In the initiative's first five years, 100 community college STEM transfer students received \$1.5 million in scholarships. Students have achieved their goal of a bachelor's degree and more. A good number of scholars have continued beyond the B.S. degree and have enrolled and completed advanced degrees in prestigious doctoral and professional school programs.

In 2006, Edison International renewed the commitment for another five-year cycle, with the University of California, Irvine providing matching funds. The program is administered through CAMP Statewide, utilizing a network of transfer program contacts at forty California Community Colleges within the Edison service area. A formal reception in January 2008 honored Edison International and representatives Frank Quevedo and Ronald Litzinger

Remarks were offered by Chancellor Michael V. Drake, M.D., Vice Chancellor Manuel Gomez, and Director Stephanie Reyes-Tuccio, UCI Center for Educational Partnerships. Selected Edison Scholars

*"Edison International is an important partner in supporting the degree goals of transfer students."*

—Dr. Michael V. Drake, Chancellor, UC Irvine

Sandra Tran and Rurico Neri gave moving testimonials on the significance of support for community college transfer students in science, engineering and math.

The scholars are exposed to a systemwide network of faculty and peers through participation in activities such as the annual CAMP Statewide Symposium. The symposium brings together like minds and harmonious interests, and nurtures a sense of discovery on many levels. It provides an opportunity

to meet science majors from throughout the University of California and learn about each other's respective campuses,

particularly with considerations for graduate studies. Presenting at the CAMP Symposium and publication in the symposium proceedings has highlighted the academic achievements of the Edison Scholars. The program advances diversity goals for the professional workplace as well as helps diversify graduate programs and professional schools.

Edison's support of the UCI American Indian Summer Program was also recognized, with a special presentation of a Pendleton blanket by Nikishna Polequaptewa, Director of the American Indian Resource Program.

**Chancellor Michael Drake and Vice Chancellor Manuel Gomez hosted a formal reception honoring the UC-Edison Scholars. Frank Quevedo and Ronald Litzinger of Southern California Edison were recognized for their commitment to minority STEM transfers to UC. At far left, Dr. Debra Richardson, Dean, Donald Bren School of Information and Computer Sciences.**





## THE 2007-2008 UC EDISON SCHOLARS

### JORGE ANGULO

- Orange Coast College; Mechanical Engineering
- Career Goal: Professional Engineer  
"I want to be the best engineer I possibly can."

### GILDARDO BARRON

- Citrus College; Biological Sciences
- Career Goal: Cardio-thoracic surgeon  
"[Personal experiences] have increased my interest in cellular development, immunology, and anatomy."

### JESUS ESCAMILLO

- Fullerton College; Mathematics
- Career Goal: Medical doctor  
"Math is my passion but my other passion is medicine."

### LORRAINE HARO

- Long Beach, City College, Mathematics
- Career Goal: Math teacher  
"I focus on the future of teaching by applying my math skills to earn a degree that I can use to inspire a new generation of students."

### IRENE LIZARRAGA

- Fullerton College Biological Sciences
- Career Goal: Physical therapist or pharmacist  
"Helping people is something I am passionate about."

### ARIADNA ORTIZ

- College of the Desert, Biological Sciences
- Career Goal: Physician specializing in oncology  
"I believe that I am an example of a responsible and persistent person."

### SONIA SERRANO

- Chaffey College, Biological Sciences
- Career Goal: Research in cell biology or biochemistry  
"I am a biology major but I am also interested in math and physics."

### JOSHUA TUTWILER

- Mt. San Jacinto College, Computer Science
- Career Goal: Computer Programmer  
"I cannot wait for the year ahead of me in my college adventure."

### JOHN VILLASENOR

- El Camino College, Biological Sciences
- Career Goal: Medical doctor and surgeon  
"I have always had an interest in the natural sciences."

## THE 2006-2007 UC EDISON SCHOLARS

### AURORA CARDENAS

- East Los Angeles College; Public Health Sciences
- Career Goal: Medical doctor working in an underserved community  
"My knowledge base, strength of mind, and resolve are qualities that will help me be a successful student."

### VICTORIA FLORES

- Fullerton College, Ecology and Evolutionary Biology
- Career Goal: Medical science, women's health  
"I seek to acquire the necessary technical skills to conduct research, especially at the molecular level of human disease."

### AMEENAH HOWARD

- Riverside Community College, Biological Sciences
- Career Goal: MD/Ph.D.  
"My ultimate goal is to allow individuals to improve their level of healthcare, standard of living, and quality of life."

### RICARDO MONTOYA

- Long Beach City College, Biological Sciences
- Career Goal: Neurologist  
"I believe that when I help other people, in essence I am helping myself by making others smile around me, which in turn satisfies me to know I made a difference."

### CHARNE MOORE

- Irvine Valley College, Biological Sciences
- Career Goal: Medical doctor  
"My love for biology and helping others began early in my childhood. I bring to the University of California, Irvine the spirit of compassion combined with academic excellence."

### ERIK PACHAS

- Mt. San Antonio College, Mathematics
- Career Goal: Mathematics teacher  
"I am looking forward to teaching elementary or high school."

### DANILO SANTAMARIA

- College of the Canyons, Biomedical Engineering
- Career Goal: Biomedical Professor  
"I have become very excited about this branch of engineering."

### EDNA SANTILLAN

- Rio Hondo College, Biomedical Engineering
- Career Goal: Science Education

### SANDRA TRAN

- Fullerton College, Biomedical Engineering
- Career Goal: Biomedical Engineer  
"As a student, I wish to be successful; as a mother, I wish to be a beacon to my children; and as a member of society, I wish to be productive. Becoming a biomedical engineer will prove to be one of the most important decisions of my life."

### JUAN O. VASQUEZ

- Mechanical Engineering
- UC Berkeley, B.S. 2007
- UC LEADS Research Scholar, 2006 - 2007
- Member of Society of Hispanic Professional Engineers

Alabama North Carolina Northeast Ohio  
 Arkansas California State Minnesota Pacific Alliance  
 All Nations North Star - Oklahoma  
 Colorado Peach State  
 Florida-Georgia Philadelphia  
 Georgia Puerto Rico  
 Houston South Carolina  
 Illinois State University  
 Indiana of New York (SUNY)  
 Islands of Opportunity - Hawaii Tennessee  
 Kentucky - West Virginia Texas  
 Louisiana University of Texas System  
 Michigan University System of Maryland  
 Mississippi Washington - Baltimore -  
 Missouri Hampton Roads  
 New Mexico New York City  
 New York Western Alliance to  
 City expand Student Opportunity (WAESO)  
 Wisconsin

*California*  
 UNIVERSITY OF CALIFORNIA  
**CAMP**

*Part of  
 Something  
 Bigger*



**LOUIS STOKES  
 ALLIANCE FOR  
 MINORITY  
 PARTICIPATION**

*A Grant  
 Through the  
 National Science  
 Foundation*

