

California Louis Stokes
Alliance for Minority Participation



Statewide Undergraduate
Research Symposium
Proceedings & Profiles 2005



Davis

Irvine

San
Diego

Santa
Barbara

Riverside

Los
Angeles

Santa
Cruz

Berkeley

CALIFORNIA

UNIVERSITY OF

CALIFORNIA ALLIANCE FOR MINORITY PARTICIPATION
IN SCIENCE, ENGINEERING AND MATHEMATICS
UC CAMPUS SITE DIRECTORY
UNIVERSITY OF CALIFORNIA
Robert C. Dynes, President



UC BERKELEY

ROBERT J. BIRGENEAU, CHANCELLOR
MARK A. RICHARDS, PH.D.
REGIONAL DIRECTOR
Dean of Physical Sciences
Professor of Earth & Planetary Science
University of California
Berkeley, CA 94720
510-642-4982
markr@seismo.berkeley.edu

COLETTE PATT, PH.D.
COORDINATOR
Student Diversity Programs
College of Letters & Science
510-642-0794
colette_patt@ls.berkeley.edu

ARJA McCRAY, PH.D.
PROGRAM DIRECTOR
Physics Scholars Program
amccray@uclink.berkeley.edu
510-643-2921
Fax: 510-642-7578

UC DAVIS

LARRY N. VANDERHOEF, CHANCELLOR
GARY E. FORD, PH.D.
REGIONAL DIRECTOR
Associate Dean
College of Engineering
University of California
Davis, CA 95616-5294
530-752-0556
Fax: 530-752-2123
ford@ece.ucdavis.edu

RENÉE J. MALDONADO
DIRECTOR OF STUDENT
DEVELOPMENT AND RECRUITMENT
UC Davis MESA Center
College of Engineering Dean's Office
530-752-3390
Fax: 530-752-0556
rjmaldonado@ucdavis.edu

UC LOS ANGELES

ALBERT CARNESALE, CHANCELLOR
RICHARD L. WEISS, PH.D.
REGIONAL DIRECTOR
Department of Chemistry & Biochemistry
University of California
Los Angeles, CA 90095-1569
310-825-3621
Fax: 310-206-4038
weiss@chem.ucla.edu

LAINA LONG
COORDINATOR
CARE Center
310-206-4600
Fax: 310-267-2219
lainal@lifesci.ucla.edu

UC SANTA CRUZ

DENICE D. DENTON, CHANCELLOR
A. RUSSELL FLEGAL, PH.D.
REGIONAL DIRECTOR
Division of Physical and Biological
Sciences
University of California
Santa Cruz, CA 95064
831-459-2093
Fax: 831-459-2935
flegal@etox.ucsc.edu

MARLENE ROBINSON
COORDINATOR
Division of Physical and Biological
Sciences
831-459-3487
Fax: 831-459-4161
marobins@ucsc.edu

UC IRVINE

RALPH J. CICERONE, CHANCELLOR
DEREK DUNN-RANKIN, PH.D.
REGIONAL DIRECTOR
Department of Mechanical &
Aerospace Engineering
University of California
Irvine, CA 92697-3975
949-824-8745
Fax: 949-824-8585
ddunran@uci.edu

KIKA FRIEND
COORDINATOR
107 Rockwell Engineering Center
949-824-2363
Fax: 949-824-2634
kika@uci.edu

UC RIVERSIDE

FRANCE A. CORDOVA,
CHANCELLOR
MICHAEL J. MARSELLA, PH.D.
REGIONAL DIRECTOR
Department of Chemistry
University of California
Riverside, CA 92521
951-827-7223
Fax: 951-827-4713
michael.marsella@ucr.edu

TERESA COFIELD
COORDINATOR
The Learning Center
951-827-5326
Fax: 951-827-4543
tcfield@pop.ucr.edu

UC SANTA BARBARA

HENRY T. YANG, CHANCELLOR
GLENN E. BELTZ, PH.D.
REGIONAL DIRECTOR
College of Engineering
University of California
Santa Barbara, CA 93106
805-893-3354
beltz@engineering.ucsb.edu

BOB COTA
COORDINATOR
College of Engineering
805-893-8333
Fax: 805-893-5027
bcota@engineering.ucsb.edu

UC SAN DIEGO

MARYE ANN FOX, CHANCELLOR
DAVID M. ARTIS, PH.D.
REGIONAL DIRECTOR
Academic Enrichment Programs
University of California, San Diego
La Jolla, CA 92093-0074
858-822-4161
Fax: 858-534-8895
dartis@ucsd.edu

JACQUELINE AZIZE-BREWER, PH.D.
COORDINATOR
Academic Enrichment Programs
858-534-8839
Fax: 858-534-8895
jazize@ucsd.edu

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

RALPH J. CICERONE
Chancellor
Principal Investigator

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

NICOLAOS ALEXOPOULOS
Dean, Henry Samueli School of Engineering
Co-Principal Investigator

MARJORIE DEMARTINO
Associate Executive Director
Proceedings & Profiles Editor
949-824-4813
dmartino@uci.edu

JUAN FRANCISCO LARA
Assistant Vice Chancellor
Executive Director
949-824-6362
jflara@uci.edu

SANTANA RUIZ
Assistant Director
Community College Outreach
949-824-1015
sruiz@uci.edu



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

CAMP is one of 34 Louis Stokes
Alliances for Minority Participation
funded by The National Science
Foundation. To view the national
programs directory, visit
www.california-lsamp.uci.edu.

California Louis Stokes
Alliance for Minority Participation



Statewide Undergraduate
Research Symposium
Proceedings & Profiles 2005

Arnold and Mabel Beckman Center
of the National Academies
of Sciences and Engineering
February 25-27

The CAMP Statewide Undergraduate Research Symposium
is a student development opportunity supported by
the National Science Foundation and the University of California.

Davis

Irvine

San
Diego

Santa
Barbara

Riverside

Los
Angeles

Santa
Cruz

Berkeley

UNIVERSITY OF CALIFORNIA

CAMP General Information

UNIVERSITY OF CALIFORNIA
LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION
IN SCIENCE, ENGINEERING, AND MATHEMATICS



Summary

The California Alliance, administered at UC Irvine is in “Phase III,” a third five-year funding cycle, 2001-06. The primary goal is to significantly increase the number of B.S. degrees granted to underrepresented minority students in STEM (science, technology, engineering mathematics) majors at the University of California. Offered at the eight general UC campuses, CAMP has created a systemwide network of faculty, program staff, and students working toward common goals, including completion of the B.S. degree and preparation for and transition to graduate school or the scientific workplace. This effort has contributed to a 78% increase in B.S. degrees granted by UC from the baseline year (1990-91), for a total of 12,396 B.S. degrees awarded to underrepresented minorities by UC since 1990. In addition to faculty mentored research experiences, principal activities include peer mentoring and tutoring, collaborative learning, presenting at scientific conferences, science writing and co-authorship, technology proficiency, and preparation for graduate school. CAMP is one of 34 national alliances named for former congressman Louis Stokes (Ohio).

Bridge to the Doctorate

BACKGROUND: The National Science Foundation Directorate for Education and Human Resources, through the Division of Human Resource Development, awarded funding beginning in 2003 for the first cohort of graduate students in the Louis Stokes Alliances for Minority Participation (LSAMP) supplemental activity, “Bridge to the Doctorate.” The goal of these supplements is to fund an initial graduate degree bridge activity at Phase III LSAMP Alliance institutions. Phase III indicates the third five-year cycle of NSF funding. “Bridge” funding supports sustained and comprehensive approaches that facilitate achievement of the long-term goal of increasing the number of students who earn doctorates in STEM fields, particularly those from populations underrepresented in these fields.

CAMP BRIDGE TO DOCTORATE: The California Alliance, currently in its 14th year, has received funding for Cohort I at UCLA and Cohort II at UC Irvine. A third cohort is to be funded for Fall 2005, hosted by UC San Diego. Taking the lead on the BD activity will be Dr. David Artis, CAMP Director, working collaboratively with Tim Johnston, Assistant Dean, Office of Graduate Studies and Research, and Dr. Jacqueline Azize-Brewer, CAMP Science Program Coordinator. UC San Diego’s degree completion rate for

underrepresented graduate students in STEM fields is approximately 78%. This compares very favorably with comparable institutions. From 2001-2005, the UC San Diego CAMP program has tracked 45 participants who have continued on to graduate or professional school. *Quality Education* has recently honored UC San Diego for the high number of minority doctoral degree recipients in math, sciences, and engineering. *Hispanic Outlook in Higher Education* rates UCSD 13th among U.S. universities awarding doctoral degrees to Hispanic students. UCSD’s overall doctoral completion rate of 63% is well above the national average of 50%. Funds support Bridge Fellows for two years, with the caveat that, given the level of support in the monthly stipend, students do not work during the academic year but focus on their coursework and research.

Thank you, Dr. A. James Hicks, National Science Foundation LSAMP Program Director, for all your efforts to secure and sustain funding for the Bridge to the Doctorate supplemental activity.

Table of Contents



- 4** *Editor's Note/Symposium Goals*
- 5** *Schedule of Events*
- 6** *Speaker Bios*
- 8** *Symposium Judges*
- 10** *Symposium Presenters*
- 13** *Special Merit in Research Abstracts*
- 27** *Ruben Alarcón, Ph.D.,
Tips for Graduate School*
- 28** *Peter Velázquez, Ph.D.*
- 31** *UC Student Profiles
& Alumni Updates*
- 37** *Acknowledgements*



"The quality of both the research and presentations, which have always been excellent, improved markedly again this year."

—Gary Ford, UC Davis CAMP Faculty Director

"The sense of community that CAMP fosters is one of the program's attributes that we value. For 14 years CAMP has contributed to the development of student researchers who support each other's goals for the bachelor's degree and also for graduate school as well as professional careers. I am a strong supporter of student engagement in research and the collaborative teamwork it inspires. Research strengthens your baccalaureate degree and prepares you for graduate education."

—Ralph J. Cicerone, Chancellor, University of California, Irvine
Principal Investigator, California LSAMP

Editor's Note

Something very special comes from bringing undergraduate researchers together from across the University of California. The exchange of ideas, experiences, and perspectives is rich and rewarding. This publication, then, is a testimony to student achievement and hard work well worth the effort. Congratulations to all the presenters who joined us for our annual symposium at the Beckman Center of the National Academies of Sciences and Engineering. Sixteen undergraduates representing eight UC campuses took home awards for Special Merit in Research. The award-winning abstracts presented as the heart of this publication provide a taste of the varied and creative topics that inspired us all.

Ralph J. Cicerone, Chancellor of UC Irvine and Principal Investigator of CAMP Statewide, gave opening remarks at the awards dinner. The Chancellor's strong support of CAMP goals is legendary. He was a co-principal investigator for the original CAMP proposal submitted to the National Science Foundation in 1990. The grant was funded and renewed twice, a testament to the University's support at the highest levels. Dr. Cicerone was presented with a special award for his long-standing commitment to CAMP. He told the gathering that the majestic eagle (see p. 6) will grace his desk in Washington, D.C., when he takes up the Presidency of the National Academy of Sciences, July 2005.

Thanks to everyone, especially our UC program coordinators, who contributed to the success of our annual symposium. We have seen students advance from this statewide forum to achieve recognition at national professional meetings. Doing so, they build credentials for scientific and technical careers. They bring distinction not only to themselves but to their alma mater and to the University of California—the world's most prestigious public research university.

—Marjorie DeMartino, Associate Executive Director

The CAMP Symposium Aims To:

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

Statewide Symposium Goals

The symposium provides a forum for the presentation of undergraduate research, scholarship, and creativity in science, technology, engineering, and mathematics (STEM). It brings together like minds and harmonious interests, and nurtures a sense of discovery—on many levels. It is hoped that the experience will be an enriching one for every student presenter and observer, and that it will also foster new collegial relationships and friendships. The symposium 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. Peer networking is an important dimension of the symposium.

Role of the Faculty Mentor

- Provide supervision and support for the CAMP undergraduate researcher by introducing him or her to the culture of the laboratory, and assisting him or her to explore and become proficient in research methodologies and in the research tools of the discipline.
- Support the student in transitioning his/her role in the research team, 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.
- For a long-term project, where feasible, direct the student in the technical writing process, preparing notes as a writing resource and eventually, if compelling, a polished manuscript for possible co-authorship and publication.

Schedule of Events

FRIDAY, FEBRUARY 25, 2005

- 5:00-8:30pm **Registration and Check in**, Irvine Marriott Hotel
7:00-8:30pm **Welcome Dinner**, Welcome & Introductions

SATURDAY, FEBRUARY 26, 2005

- 8:00 - 8:30am **Shuttles** from Irvine Marriott Hotel to The Beckman Center of the National Academies of Sciences and Engineering, UCI
- 8:30am **Faculty Judges Orientation**, Balboa Room
- 9:00am **Symposium Opening**, Auditorium
Welcome by Dr. Martha Mecartney, Professor, Chemical Engineering & Materials Science
Recipient of the NSF Presidential Award for STEM Mentoring
Welcome by Luis Rodriguez, Bridge to the Doctorate Fellow
- 9:30 - 10:30am **Poster Session I** (Atrium area), Oral Session I (Auditorium, Huntington)
- 10:30 - 11:00am **Break**
- 11:00am - 12:15 **Poster Session II** (Atrium area), Oral Session II (Auditorium, Huntington)
- 12:15 - 1:30pm **Buffet Lunch**, Garden Patio
- 1:45 - 3:00pm **Poster Session III** (Corridor); Oral Session III (Auditorium, Huntington)
- 1:45 - 3:00pm **Graduate School Workshop A**, Bridge to Doctorate Fellows Panel, Newport Room - UCI and UCLA Fellows
- 3:00 - 3:15pm **Break** - Refreshments in Outdoor Fountain Area
- 3:15 - 4:30pm **Poster Session IV** (Corridor); Oral Session IV (Auditorium, Huntington)
- 3:15 - 4:30pm **Graduate School Workshop B**, Bridge to Doctorate Fellows Panel, Newport Room - UCI and UCLA Fellows (Cohort I and II)
- 4:30 - 5:45pm **Walking Tour** of UCI Campus
- 6:00 - 7:30pm **Awards Dinner**, Beckman Center Atrium Area;
Welcome by Chancellor Ralph J. Cicerone
Special presentation to Chancellor Cicerone, Recognizing CAMP Support Since 1991
Keynote by Jaquan Horton, CAMP-NSF Graduate Fellow, Bridge to the Doctorate, UCI
Recognition of the Faculty Judges and Program Coordinators
Presentation of Special Merit in Research Awards
- 7:30pm **Shuttles** Return to Marriott; Irvine Spectrum Nightlife On Your Own

SUNDAY, FEBRUARY 27, 2005

- 8:00-10:30am **Informal Breakfast Buffet**, Hotel
12:00 noon **Check Out** of Rooms, Return to Home Campus

Criteria for Special Merit in Research

Each presentation, oral or poster, is evaluated by the following:

- 1. Originality.** Did the project require some creativity by the student or was it routine?
- 2. Depth of understanding** and clarity of presentation.
- 3. Likelihood of sparking further research.** Did this project raise further research possibilities, or were the results a dead-end?

A spreadsheet program based on 10 points produced a weighted average for each student. The suggested weights for the above are: (1) 3 points; (2) 4 points; (3) 3 points.



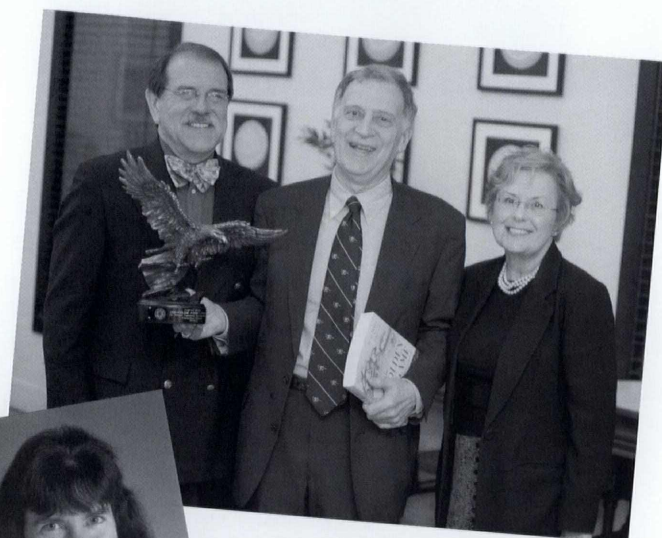
Speaker Bios

Dr. Ralph J. Cicerone

Chancellor, UC Irvine; Principal Investigator, CAMP-NSF Statewide; Daniel G. Aldrich Chair in Earth System Science; Professor of Chemistry

An internationally acclaimed scientist, Ralph J. Cicerone became UCI's fourth chancellor in 1998. His research in atmospheric chemistry and climate change has involved him in shaping science and environmental policy at the highest levels, with a host of national and international agencies. In 1997, he received a United Nations Environment Program Ozone Award for research in protecting the Earth's ozone layer. His research was also recognized on the citation for the 1995 Nobel Prize in chemistry awarded to F. Sherwood Rowland. The Franklin Institute recognized his outstanding contributions to the understanding of greenhouse gases, ozone depletion and his fundamental research in biogeochemistry by selecting Cicerone as the 1999 laureate for the Bower Award and Prize for Achievement in Science. In 2001, he led a National Academy of Sciences study of the current state of climate change and its impact on the environment and human health, requested by President Bush. The American Geophysical Union awarded Cicerone its 2002 Roger Revelle Medal, which recognized outstanding research contributions to the understanding of Earth's atmospheric processes, biogeochemical cycles or other key elements of the climate system. Cicerone is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophical Society. He has served as President of the American Geophysical Union, the world's largest society of earth scientists, and he received the James B. Macelwane Award in 1979 for outstanding contributions to geophysics. He has published about 100 refereed papers and 200 conference papers, and has presented invited testimony to the U.S. Senate and House of Representatives on a number of occasions. Cicerone received his bachelor's degree in electrical engineering from MIT, where he was a varsity baseball player, and earned both his master's and doctoral degrees from the University of Illinois in electrical engineering, with a minor in physics.

In 2004, he won the Albert Einstein World Award of Science. Beginning July 1, 2005, Cicerone will become the next president of the National Academy of Sciences, based in Washington, D.C.



Martha L. Mecartney

Professor, Chemical Engineering and Materials Science; Professor, Advanced Power

and Energy Program; Professor, Integrated Nanosystems Research Facility

UC Irvine Professor Martha Mecartney is interested in sol-gel processing of oxide ceramics, including thin films, grain boundaries in ceramics, interfacial engineering of superplastic ceramics, and analytical transmission electron microscopy. One of her current research projects focuses on grain boundary structure and ionic conductivity in yttria stabilized zirconia (YSZ) ceramics. YSZ is used as a solid electrolyte in high-temperature fuel cells (those operating above 800 degrees Celsius). While certain additives can enhance the ability to shapeform YSZ into shapes that are efficient for fuel cell design, the influence of these additives on ionic conductivity and the ultimate performance of the fuel cell is not well understood. Dr. Mecartney's group is investigating these issues using impedance spectroscopy to analyze the grain interior and grain-boundary conductivity, and electron microscopy to characterize the microstructure and special distribution of the additives at the grain boundaries, in addition to conducting superplastic deformation experiments. She received the 2003 National Science Foundation Presidential Award for Excellence in Mathematics, Science, and Engineering Mentoring. At UCI, she has a record of twelve years' sustained undergraduate mentoring and dedication to student achievement. She is a role model for women in engineering, and works to increase the number of girls interested in engineering careers. Dr. Mecartney completed a Ph.D., Stanford University, Materials Science and Engineering, 1984; M.S., Stanford University,

Materials Science and Engineering, 1980; and B.S., Case Institute of Technology, Case Western Reserve University, Metallurgical Engineering and Materials, 1979. Additionally she earned a bachelor's degree in Classics at Case Western Reserve University.

Luis A. Rodriguez

*CAMP-NSF Bridge to the Doctorate Fellow,
Pursuing a Ph.D. in Robotics, UC Irvine*

Luis Rodriguez was born in Jalisco, Mexico and at the age of eight moved to the United States with his family. He received a B.S. degree at the University of California San Diego and a M.S. at the University of Wisconsin at Madison in mechanical engineering. He is currently pursuing a Ph.D. in Robotics at UC Irvine. His career goal is to apply the principles of multibody dynamics, optimal control, and machine-learning to assistive robot systems, in hopes of helping people improve or overcome physical disabilities with the aid of robots. It is his hope that the Ph.D. degree will be used for more than robotics, but will be an inspiration for future generations of underrepresented to students so that they too may become research scientists.

Of his career path, Luis states, "At times, it has been difficult to determine what career path to take. I have turned to the advice of my fellow graduate students, counselors and faculty. My decision to continue my work towards a doctoral degree is fueled by the passion that my parents and mentors have instilled in me. He adds, "The lack of minority representation is just one of the reasons that have pushed me to pursue my Ph.D. degree."

As an undergraduate student he presented research at UC Day in Sacramento and at SACNAS (Society for Advancement of Chicanos and Native Americans in Science). He co-chaired a symposium entitled "Issues Facing Minority Scientists" at 2004 SACNAS National Conference, Austin, Texas.

Luis had the opportunity to mentor for SURE-REU (Summer Undergraduate Research Experience and Research Experience for Undergraduates) at the University of Wisconsin. The program's main goal is to expose undergraduate students to rigors of research and to give them exposure to other

laboratories on campus. This experience was "very instructive" and helped him to realize his "short comings" as a first time mentor and led him to appreciate his own undergraduate mentors.

He will be the first in his family to earn a doctoral degree. He says, "My parents have always played a pivotal role in my success. Although, they never had the opportunity to attend college they have always been really passionate about supporting me in all my academic endeavors."

Jaquan M. Horton

*CAMP Bridge to the Doctorate Fellow,
Pursuing a Ph.D. in Ecology & Evolutionary
Biology, UC Irvine*

Jaquan M. Horton is a native of Boston, Massachusetts. He received his B.S. degree in Biology from the University of Massachusetts, Amherst, in 2003. While at UMass, he worked on a number of independent research projects in Dr. Elizabeth Brainerd's Biomechanics and Comparative Physiology Laboratory. The subject of his research ranged from measuring prey-capture success rates in antlions to his published thesis work that focused on describing and quantifying the appendicular and axial systems, as well as the gait patterns of aquatic walking in two salamander species. Currently, Jaquan is a first year Ph.D. student in the Department of Ecology & Evolutionary Biology at the University of California, Irvine. He works in the laboratory of Dr. Adam Summers, whose research deals with various aspects of the awesome world of Biomechanics and Functional Morphology. Jaquan's research focuses on assessing and quantifying the material and mechanical properties of cellular and acellular bone in teleost fishes. Upon completion of his degree, Jaquan would like to continue conducting research in an academic setting, but is also very adamant about creating outreach programs and fortifying and developing science curriculums in urban school systems. In summer 2005 he will further his doctoral degree interests and career goals with an internship he has accepted at the University of Washington Fish Institute.

"I am a UC Davis LEADS Scholar and was invited by Renee Maldonado to present at this year's CAMP Symposium. I just wanted to give a personal thanks to you [Melina Duarte], Dr. Lara and Marjorie DeMartino for your commitment to students and higher education. It was my first time attending a CAMP Symposium and I was greatly impressed. Hope you continue that support and I'll see you next year!"

—Selena R. Martinez, UC LEADS Scholar, UC Davis

2005 Statewide Symposium Judges & Presiders

ORAL SESSION I AND II PHYSICAL SCIENCES/ENGINEERING

Dr. Derek Dunn-Rankin, UC Irvine CAMP Faculty Director, *Presider*

Dr. Amelia Regan, Associate Professor, Computer Science Systems, UC Irvine

Dr. Philippe Relouzat, Science and Technology Coordinator, Learning & Academic Resource Center, UC Irvine

Dr. Robert Rinker, Professor Emeritus, College of Engineering, UC Santa Barbara, former CAMP Faculty Director

Dr. Glenn Beltz, Associate Professor, Mechanical & Environmental Engineering, UC Santa Barbara, CAMP Faculty Director

POSTER SESSION I AND II PHYSICAL SCIENCES/ENGINEERING

Dr. Gary Ford, Professor and Associate Dean of Engineering, UC Davis, CAMP Faculty Director

Dr. James Shackelford, Professor of Chemical Engineering and Materials Science, UC Davis; former CAMP Faculty Director

Dr. Martha Mecartney, Professor of Chemical Engineering and Materials Science, UC Irvine

ORAL SESSION III and IV PHYSICAL SCIENCES/ENGINEERING

Dr. Martha Mecartney, Professor of Chemical Engineering and Materials Science, UC Irvine, Faculty Mentor, *Presider*

Dr. Philippe Relouzat, Science and Technology Coordinator, Learning & Academic Resource Center, UC Irvine

Dr. Glenn Beltz, Associate Professor, Mechanical & Environmental Engineering, UC Santa Barbara, CAMP Faculty Director

Dr. Neal Schiller, Professor of Biomedical Sciences, UC Riverside/UCLA



POSTER SESSION III and IV PHYSICAL SCIENCES/ENGINEERING

Dr. Robert Rinker, Professor Emeritus, College of Engineering, UC Santa Barbara, former CAMP Faculty Director

Dr. Gary Ford, Professor and Associate Dean of Engineering, UC Davis, CAMP Faculty Director

Dr. James Shackelford, Professor of Chemical Engineering and Materials Science, UC Davis

ORAL SESSIONS I, II, III BIOLOGICAL/LIFE SCIENCES

Dr. Peter Velázquez, UCLA, former CAMP participant and new Ph.D., *Presider*

Dr. Michael Marsella, Professor of Chemistry, UC Riverside; CAMP Faculty Director

Dr. Gina Holland, Director, Biology Undergraduate Scholars Program; Associate Director Division of Biological Sciences Educational Enrichment and Outreach Programs

Dr. Elizabeth Yoder, Assistant Research Scientist, Radiology, UC San Diego; Chancellor's Advisory Committee on the Status of Women and Co-Chair, Women in Science and Engineering, UC San Diego

Dr. Kenneth Millett, Professor of Mathematics, UC Santa Barbara, former UCSB CAMP Faculty Director; Presider for both categories of posters

POSTER SESSIONS I, II, III BIOLOGICAL/LIFE SCIENCES POSTER

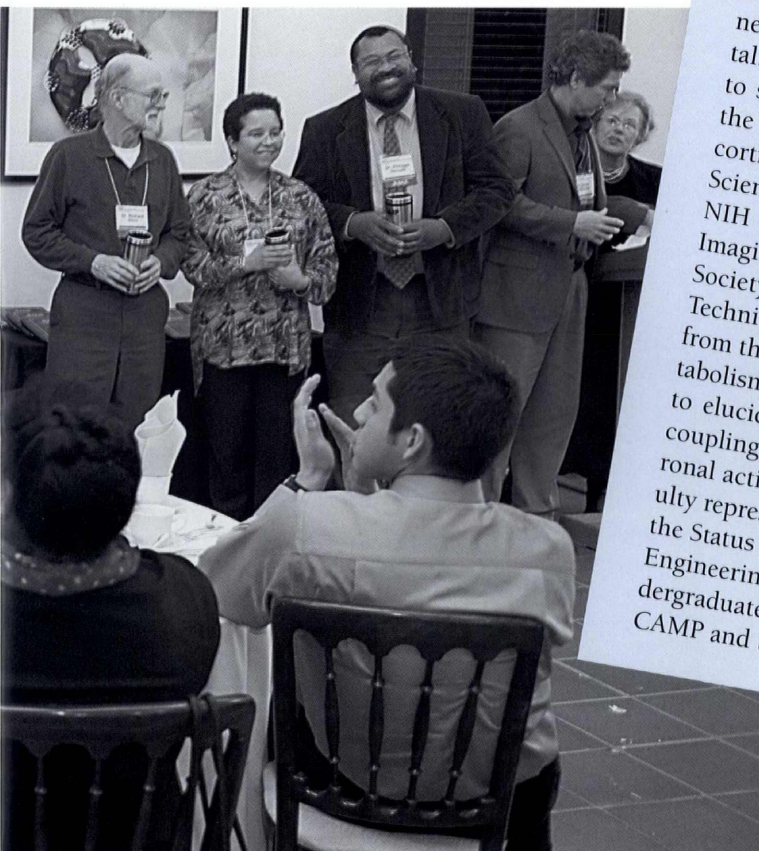
Dr. Richard Weiss, Professor of Biochemistry and Chemistry, UCLA; CAMP Faculty Director

Dr. Enrique Cometto-Muniz, Research Scientist, Surgery, UC San Diego

Dr. Paul Larsen, Professor of Biochemistry, UC Riverside

SPOTLIGHT ON SYMPOSIUM JUDGE, Biological Science Sessions: Elizabeth Yoder, UC San Diego

Dr. Elizabeth Yoder received her Ph.D. from UC San Diego's top-ranked Neuroscience program. She completed post-doctoral training in Neurology at UCLA and in Physics at UCSD, and performed a visiting fellowship in Functional Magnetic Resonance Imaging at the Massachusetts General Hospital. She was supported in these programs by NIH fellowships to study systems and integrative neurobiology, the biology of the blood-brain barrier, and neurovascular coupling in single cortical capillaries. Currently, Dr. Yoder is an Assistant Research Scientist in Radiology at UCSD. She is a recent recipient of an NIH Career Award from the National Institute of Biomedical Imaging and Bioengineering (NIBIB) and a past recipient of a Society for Photo-Optical Instrumentation Engineers (SPIE) Technical Award and a Bursary Award for Young Investigators from the International Society for Cerebral Blood Flow and Metabolism. Her research uses multiple neuroimaging modalities to elucidate the principles and mechanisms of neurovascular coupling, including the physiological roles played of non-neuronal activity in the brain. At UCSD, Dr. Yoder serves as a faculty representative on the Chancellor's Advisory Committee on the Status of Women, and co-chairs the Women in Science and Engineering (WISE) subcommittee. She strives to provide undergraduate students with quality research experience through CAMP and the Faculty Mentor Program.



2005 Undergraduate Research Presenters

Oral Presenters

Yonas Alemu

UC Irvine
Physical Sciences/
Engineering

Yanina Barrera

UC Irvine
Physical Sciences/
Engineering

Silvestre Bravo

UC San Diego
Physical Sciences/
Engineering

Miguel Buenrostro

UC Santa Barbara
Physical Sciences/
Engineering

Luis Busso

UC Santa Barbara
Physical Sciences/
Engineering

Blanca Canales

UC Berkeley
Physical Sciences/
Engineering

Andrew Cardes

UC Berkeley
Physical Sciences/
Engineering

Catherine Cox

UC Davis
Physical Sciences/
Engineering

Nicholas Gastelum

UC San Diego
Physical Sciences/
Engineering

Aidee Gonzalez

UC Santa Barbara
Physical Sciences/
Engineering

LaTisha Hammond

UC Santa Barbara
Biological/Life Sciences

Armando Hernandez

UC Santa Cruz
Physical Sciences/
Engineering

Jose Hernandez

U Met
Physical Sciences/
Engineering

Evita Limon

UC Riverside
Biological/Life Sciences

Jonathan E. Martinez

U Met
Biological/Life Sciences

Erik Mendoza

UC Santa Barbara
Biological/Life Sciences

Claudia Munoz

UC Santa Barbara
Biological/Life Sciences

Rachel Najera

UC Davis
Biological/Life Sciences

Cecilia Osorio

UC Riverside
Biological/Life Sciences

Jessica Pelaez

UC San Diego
Physical Sciences/
Engineering

Richard Remigio

UC Irvine
Physical Sciences/
Engineering

Gloricelys Rivera

U Met
Biological/Life Sciences

Marlena Ruberte

UC Santa Barbara
Biological/Life Sciences

Juan Miguel

Sandoval
UC Irvine
Biological/Life Sciences

Rene Sandoval

UC Santa Barbara
Biological/Life Sciences

Sean Sepulveda

UC Irvine
Biological/Life Sciences

Tyheshia Smith-

Kruck
UC San Diego
Biological/Life Sciences

Moses Oben Tataw

UC Riverside
Physical Sciences/
Engineering

Maria Tobar

UC San Diego
Biological/Life Sciences

Victoria Vasquez

UC Davis
Biological/Life Sciences

Magaly Vazquez

UC Santa Barbara
Physical Sciences/
Engineering

Michael Williams

UC Irvine
Physical Sciences/
Engineering

Hope Wilson

UC Santa Barbara
Biological/Life Sciences

SPOTLIGHT ON SYMPOSIUM JUDGE, Biological/Life Sciences Sessions: Michael J. Marsella

Professor Michael J. Marsella is Associate Professor in the Department of Chemistry at UC Riverside. He is the new faculty director for CAMP-UCR, and is well recognized for his superb mentoring of students. For this, he was awarded the Chancellor's Award to the Faculty Mentor for Excellence in Fostering Undergraduate Research (2003-2004). Marsella earned his Ph.D. in Chemistry at the University of Pennsylvania in 1995. He completed a bachelor's degree in secondary education With High Distinction at the University of Rhode Island. Marsella had an NIH postdoctoral fellowship in chemistry at the California Institute of Technology. He received the DuPont Young Professor Award and the Research Innovation Award (Research Corporation). His professional memberships include the American Chemical Society (Divisions of Polymer and Organic Chemistry), and the Materials Research Society. He serves as the chair of the Chemistry Graduate Recruiting Committee and the Organic Faculty Search Committee. His research interests include the Organic Chemistry of "functional molecules," such as molecular muscles and electrically conducting polymers. Marsella's research group at UCR is populated by both graduate and undergraduate research assistants.

Poster Presenters

Marina Acosta
UC Los Angeles
Biological/Life Sciences

Maurice Adkins
UC Riverside
Biological/Life Sciences

Yasaman Alaghband
UC Los Angeles
Biological/Life Sciences

Sonia Arevalo
UC Santa Cruz
Biological/Life Sciences

Jason Bernardo
UC Santa Barbara
Biological/Life Sciences

Jose Borunda
UC San Diego
Physical Sciences/
Engineering

Robert Bustamante
UC Davis
Physical Sciences/
Engineering

Nelson Cabrera
UC Riverside
Physical Sciences/
Engineering

Cynthia Carter
UC Riverside
Physical Sciences/
Engineering

Lorenzo Chaidez
UC Irvine
Physical Sciences/
Engineering

Christian Chanco
UC Berkeley
Physical Sciences/
Engineering

Elvia De La Cruz
UC Santa Barbara
Biological/Life Sciences

Franklin Dollar
UC Berkeley
Physical Sciences/
Engineering

Matt Gandara
UC Davis
Physical Sciences/
Engineering

Johnny Garcia
UC Los Angeles
Biological/Life
Sciences

Pablo Garcia
UC Berkeley
Physical Sciences/
Engineering

Patricia Iluore
UC Irvine
Biological/Life Sciences

Eunice Kwon
UC Los Angeles
Biological/Life Sciences

**Araceli Lopez-
Garibay**
UC Santa Cruz
Physical Sciences/
Engineering

Selena Martinez
UC Davis
Biological/Life Sciences

Carolina Mendez
UC Los Angeles
Physical Sciences/
Engineering

Carol Montes
UC Los Angeles
Physical Sciences/
Engineering

William Muir
UC Davis
Physical Sciences/
Engineering

Elliot Olaniyan
UC Los Angeles
Biological/Life Sciences

**Roselia Villalobos
Ortuno**
UC Davis
Biological/Life Sciences

Angelina Padilla
UC Davis
Physical Sciences/
Engineering

Monica Pardo
UC Los Angeles
Biological/Life Sciences

Jerry Reed
UC Irvine
Physical Sciences/
Engineering



“The CAMP Symposium provides our students the opportunity to enthusiastically share their knowledge and skills with peers, mentors and faculty. I continue to be amazed at the level of research that our students are involved in, but most importantly their comprehension of the projects.”

—Marlene Robinson,
CAMP Coordinator, UC Santa Cruz

Stephen Reed
UC Irvine
Physical Sciences/
Engineering

**Jahmeilah
Richardson**
UC Irvine
Physical Sciences/
Engineering

Cesar Rivadeneyra
UC Irvine
Physical Sciences/
Engineering

Jose Rodriguez
UC Los Angeles
Biological/Life Sciences

Valerie Rodriguez
UC Los Angeles
Biological/Life Sciences

Christine Soriano
UC Santa Barbara
Physical Sciences/
Engineering

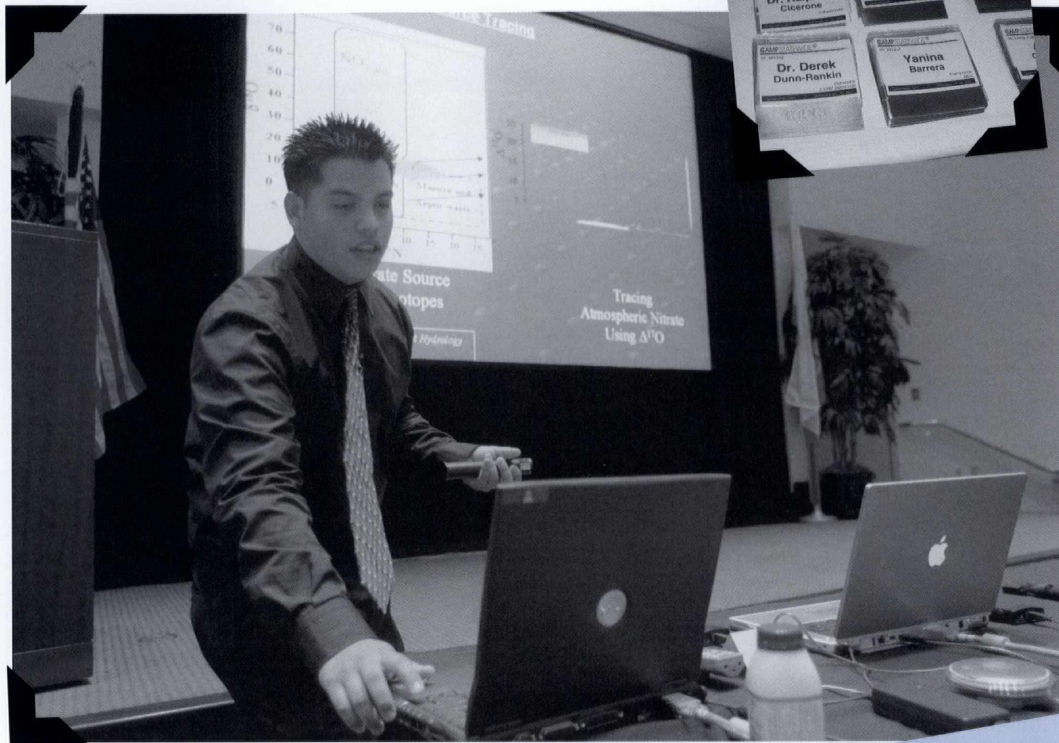
Blanca Tapia
UC San Diego
Biological/Life Sciences

Anwar Torres
UC Irvine
Physical Sciences/
Engineering

**Claudia Torres-
Pelletier**
UC Davis
Biological/Life Sciences

Yvette Valenzuela
UC San Diego
Biological/Life Sciences

Kristalia Williams
UC Davis
Biological/Life Sciences

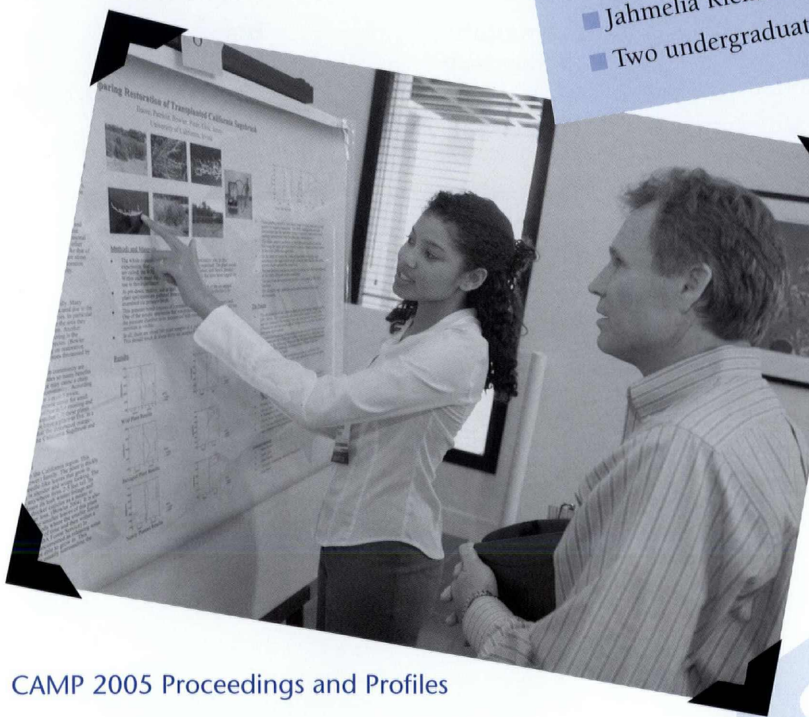


**The 2005
symposium set a
record for number
of presentations,
with 72, the most
in the seven years
since the first
annual event.**

JumpDrive Winners!

CAMP Statewide held a raffle for ten 256 MG Lexar Jump-Drives for our symposium presenters. Students can store, transfer, carry any data, anywhere. The lucky winners:

- Elvia De La Cruz, UC Santa Barbara
- Armando Hernandez, UC Santa Cruz
- Yvette Valenzuela and Jessica Pelaez, UC San Diego
- Victoria Vasquez, UC Davis
- Evita Limon, UC Riverside
- Jahmelia Richardson and Michael Williams, UC Irvine
- Two undergraduate presenters from UC Berkeley



Award Winning Presentations: SPECIAL MERIT IN RESEARCH

RESEARCH ABSTRACTS

Biological/Life Sciences – Oral Presentations

THERAPEUTIC INTERVENTION FOLLOWING CELL LOSS IN SPINAL CORD INJURY

Rachel Najera, Leon L. Hall, Department of Anesthesiology and Pain Medicine, University of California, Davis

Functional consequences of spinal cord injury (SCI) are determined by the cumulative cell death resulting from acute and secondary phases of injury. Currently, no treatments exist to ameliorate the severe deficits resulting from injury. We have developed protocols for the genetic modification of neurons and astrocytes within the spinal cord. In this study, we investigate the affects of treatment in a model of spinal cord contusion injury. We test lipid-mediated delivery of DNA plasmids encoding X-linked inhibitor of apoptosis protein (XIAP) and heat shock protein 27 (HSP27). Additionally, we examine the effects of the neuroprotective agent 17- β -Estradiol. Via intrathecal catheter, 25 μ g of plasmid encoding HSP27 or XIAP, is delivered to the level of injury. Estradiol (100 μ g) is delivered by sub-cutaneous injection. Following delivery, rats receive a moderate SCI by dropping a 7g weight 2.5cm onto the exposed dura at level T8. Rats treated with Estradiol, HSP27, or XIAP show a general trend toward improved hind limb motor function evidenced by increased fine motor control, which is assessed by the BBB 21 point open field test. However, only XIAP treated rats had a statistically significant improvement in function, scoring almost 3 points higher than control animals. These results suggest that non-viral gene delivery of XIAP may provide a novel clinically applicable treatment to improve functional outcome for patients following SCI. Nonetheless, this needs to be tested in a post injury model. Potential for efficacious treatment with HSP27 or Estradiol requires further investigation.

RACHEL NAJERA

Senior, Biological Sciences with
NPB emphasis

UC Davis

Mentor: Dr. Leon Hall

Educational/Career Goal:
Pediatrician

CECILIA OSORIO

Junior, Biology

UC Riverside

Mentor: Dr. Edith Allen

Educational/Career Goal:
Ph.D. specializing in restoration
environmental science, possibly
phytoremediation. Work at a
research university, conduct
research and teach

NITROGEN DEPOSITION EFFECTS ON NATIVE AND NON-NATIVE DESERT PLANTS

Cecilia Osorio, Edith Allen, Department of Botany and Plant Sciences, University of California, Riverside

Nitrogen deposition produced by urban sources, largely by automobiles, continuously elevates the levels of soil nitrogen available for plant uptake. Wind patterns carry much of this pollution to the western Mohave Desert. Consequently, native plant species richness of these areas has become threatened by competitive exotic non-native grasses and mustards. In this experiment the individual response to three different levels of nitrogen (including a control) was tested in five species found in Joshua Tree National Park. Three of the species collected were native (*Salvia columbariae*, *Lepidium densiflorum* and *Phacelia cicutaria*) and two were non-native (*Schismus barbatus* and *Sisymbrium altissimum*). Seeds of each species were planted in native soil in a greenhouse. Measurements of height and width were taken throughout the ninety days of this experiment as well as dried biomass at the end. The results indicate that in all species, biomass is directly proportional to the increased levels of nitrogen. In the case

of *P. cicutaria* (native), premature flowering occurred in the nitrogen deprived plants, while in the *S. barbatus* (non-native) the same treatment caused non-fertilized plants to die before flowering. This same species when treated with the highest level of nitrogen (40 ppm) flowered shortly before the end of the experiment. Therefore, we conclude that the invasion of *S. barbatus* in the western Mojave may be related to high N deposition. Areas with low N deposition or with naturally low soil N will not be subject to high densities of invasion by this grass, but will remain dominated by native species.

THE EFFECTS OF THERMAL ACCLIMATION AND SEASONAL ACCLIMATIZATION ON HSP70 EXPRESSION IN THE EURYTHERMAL GOBY, *GILlichTHYS MIRABILIS*

Marlena Ruberte, Susan G. Lund, Gretchen E. Hofmann, Department of Ecology, Evolution, and Marine Biology, University of California, Santa Barbara

Gobies inhabit the thermally diverse environments of tidal flats, bays and coastal sloughs of the eastern Pacific, which makes them an excellent model organism in which to examine the plasticity of heat shock protein (Hsp) expression. Hsps are important during stressful conditions where they function to prevent protein aggregation and protect vital cellular processes, and during normal conditions where they assist in protein folding and degradation. The purpose of this study was to examine the effects of thermal acclimation and seasonal acclimatization on the expression of the most thermally sensitive and highly conserved Hsp, Hsp70. To examine the effects of acclimation, gobies were collected from the lagoon on the University of California, Santa Barbara campus and then acclimated in groups of 20 in re-circulating aquaria at three temperatures (13, 21 and 28°C) for one month. Seasonal acclimatization effects were examined by collecting gobies from the same location every three months over a one-year period. For both studies, goby livers were removed and Hsp70 expression was measured using a Western blotting approach.

Results from the acclimation study indicate that the concentration of Hsp70 in the 28°C group was almost 50% higher than that in the 13 and 21°C groups. Seasonal data indicates that Hsp70 expression was highest in the gobies collected during the month of July, which had the highest average water temperature. Studying the mechanisms of this highly conserved response will give us a better understanding of how aquatic organisms cope with seasonal temperature fluctuations and potential global warming scenarios.

MRI AND VOLUMETRIC ANALYSIS OF A MOUSE MODEL FOR ABNORMAL BRAIN DEVELOPMENT

Tyhesia Smith-Kruck¹, Sara Berdy², Elizabeth Davis³, Joseph Gleeson³, and Elizabeth J. Yoder, Ph.D.^{*4}, Depts. of Biology¹, Biomedical Sciences², Neurosciences³, and Center for Functional MRI, Dept. of Radiology⁴, University of California, San Diego

During a recent large-scale ENU mutagenesis screening by the Tennessee Mouse Genome Consortium, a particular strain was identified as having a lower brain weight. These mutants and their wild-type counterparts were sent to UCSD for magnetic resonance imaging (MRI). An initial volumetric analysis on the MR images determined that the whole brains of the mutant mice were 9% smaller than the brains of the wild-type mice. The current project sought to determine if the reduced brain volume in mutants is distributed evenly across brain regions or if it is due to reduced volume in particular regions. Three stacks of proton-density weighted MRIs were collected at a field strength of 7 Tesla with an in-plane spatial resolution of 100 microns and a slice thickness of 350 microns. The stacks covered the brains of eight mice in three perpendicular orientations: axial, coronal, and sagittal. Volumetric analysis was applied to the MRIs in order to assess the distribution of the reduced brain volume. Each stack of images was manually segmented into five volumes: olfactory bulbs, white matter (including corpus callosum,

anterior commissure and posterior commissure), cerebellum/midbrain complex (including pons, medulla, superior colliculus and inferior colliculus), cerebral cortex (including piriform cortex), and subcortical structures (including hippocampus, hypothalamus and thalamus). Preliminary results indicate that the reduced brain volume is not evenly distributed throughout all areas of the brain, but is more pronounced in the subcortical region, white matter and cerebellum/brainstem complex than in the cerebral cortex and olfactory bulbs.

MARLENA RUBERTE

Senior, Aquatic Biology
UC Santa Barbara

Mentors: Dr. Gretchen Hoffmann and Dr. Susan Lund

Educational/Career Goal:
Single Subject Teaching
Credential; secondary biology
teacher; Master's in Education

TYHESHIA SMITH-KRUCK

Senior, General Biology
UC San Diego

Mentor: Dr. Elizabeth Yoder

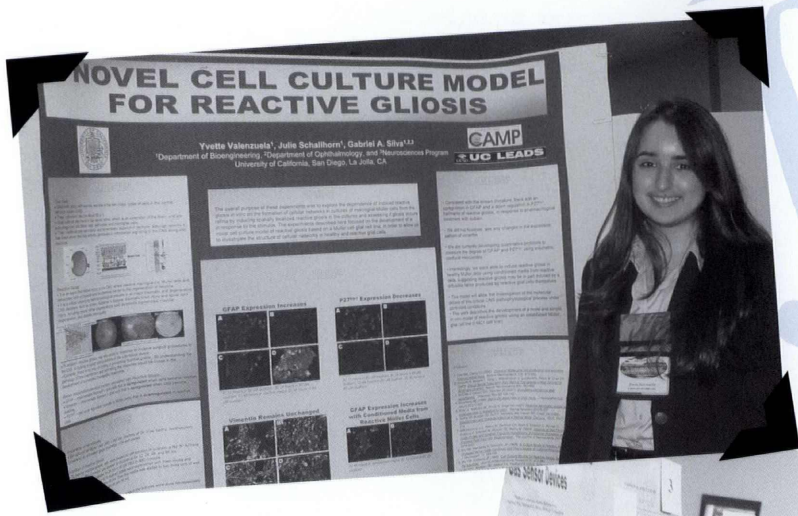
Educational/Career Goal:
Doctor of Naturopathic
Medicine/Oriental Medicine

"I, along with Evita Limon, enjoyed the graduate student panel. I personally thought it was the most inspiring part of the symposium."

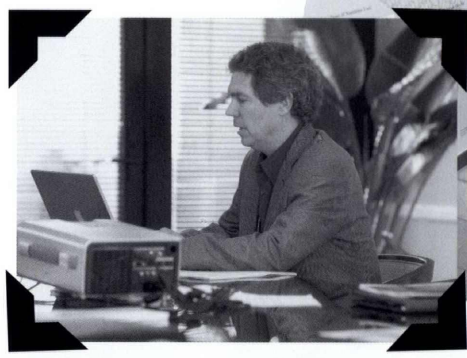
—Michael Coronado, Sophomore, Biological Sciences, UC Riverside

T2
Edt

AWARD WINNING PRESENTATIONS



A total of 16 awards were presented in two main categories, oral and poster presentations.



**In 2003-04,
there were 6,706
underrepresented
minority students
enrolled in STEM
majors UC systemwide.**

**SPOTLIGHT ON SYMPOSIUM JUDGE,
Physical Sciences/Engineering Sessions:
Glenn E. Beltz, UC Santa Barbara**

Professor Glenn Beltz focuses his teaching and research interests in ceramic composite design, solid mechanics applied to materials problems (with emphasis on the physics and mechanics of crystalline defects such as dislocations and quantum dots), and aeronautics. He is very focused on including undergraduates in the research process. He received a B.S. in Metallurgical Engineering and Materials Science at Carnegie Mellon University, and subsequently M.S. and Ph.D. degrees in Engineering Science at Harvard. Beltz conducted postdoctoral work at Brown University in Providence and the Max-Planck-Institut in Stuttgart before coming to Santa Barbara. He is a member of ASEE, ASME (for which he serves as the Advisor to UCSB's student chapter), and AIAA. Professor Beltz, Associate Professor, Mechanical Engineering, and Associate Dean, Graduate Studies, serves as the CAMP faculty director for the Santa Barbara campus.



**On July 1, 2005,
UCI Chancellor Ralph J.
Cicerone will become the
next president of the
National Academy
of Sciences.**

Biological/Life Sciences – Poster Presentations

STRUCTURAL DIFFERENCES IN THE CORPUS CALLOSUM AND HIPPOCAMPI OF INDIVIDUALS WITH WILLIAMS SYNDROME

Yasaman Alagband, Rebecca Dutton, Jennifer Geaga, Agatha Lee, Paul Thompson, Department of Neurology, University of California, Los Angeles

The purpose of this project was to use MRI brain imaging to study the anatomical differences observed in the corpus callosum (CC) and hippocampus (HP) of Williams Syndrome (WMS) patients. I hypothesized that sections of the CC with fibers projecting to the occipital and frontal lobes would be reduced in volume since these lobes function in problem-solving and visual output respectively, areas in which WMS patients are impaired. I also hypothesized the HP would show alterations in WMS patients. 40 controls and 43 WMS patients were scanned to obtain MRI images on which structures were manually digitized in 3D to study differences in the volume, area, shape, and thickness of the CC and the volume and thickness of the WMS' HP. A partitioning technique split the CC into 5 sections to investigate regional correlations with changes in lobes. CC volume was reduced and showed decreased curvature in WMS patients. WMS patients' total HP volume was increased, with thinning along the edges and increased thickness on the surface of the right HP. Reductions occurred in CC areas projecting fibers to the occipital and frontal lobes. Shape differences on the superior surface of the right HP may relate to increased language skills and music abilities of WMS patients, while deficits of the HP along the edges may relate to weaknesses in visuospatial processing. Further work is needed to assess these links. Thus, CC and HP are selectively affected in WMS syndrome and may aid in understanding how it impacts the brain.

YASAMAN ALAGHBAND

Senior, Biology w/
Neuroscience Minor
UC Los Angeles

Mentor: Dr. Paul Thompson
Educational/Career Goal:
Ph.D. in Neuroscience or
M.D./Ph.D.

JOHNNY GARCIA

Senior, Biology
UC Los Angeles

Mentor:
Dr. Araceli Espinosa-Jeffrey
Educational/Career Goal:
M.D./Ph.D. and pursue a
career in the field of genetics

CG4 OLIGODENDROCYTE CELLS SYNERGIZE WITH TROPHIC FACTOR TS1 TO ENHANCE REMYELINATION OF THE ADULT DEMYELINATED MOUSE BRAIN

Johnny Garcia, C. Agbo, O. Awosika, P. Zhao, K. Ikenaka, J. de Vellis, Araceli Espinosa de los Monteros-Jeffrey, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles

Oligodendrocytes (OLs) are cells in the central nervous system (CNS) that form and maintain myelin by synthesizing proteins such as myelin basic protein (MBP), proteolipid protein (PLP), and transferin (TF). Heterozygous (He) 4e transgenic mice are characterized by the over expression of the PLP gene; these mice containing 3 PLP gene copies myelinate normally until the age of four months, then subsequently, demyelination occurs however; the animal lives up to a year of age. The long-term goal of this project is to find the means to remyelinate the adult brain. Previous studies have shown that certain factors can promote OL proliferation, which lead to myelination. In this study, we investigated the effects of central glial-4 (CG4) cells grafted in the presence of a cocktail of trophic factors TS1 (UCLA case # 2004-488). This study was performed at the histological and immunocytochemical levels. We used 8 month old 4e mice showing hind limb impairment. Grafted animals showed graft survival migration. Immunocytochemistry data showed remyelination of naked axons. We found a greater extent of remyelination in animals treated with CG4+TS1, rather than with no treatment. These animals also showed recovery of function of the hind limbs. We have determined that this combined therapy results in remyelination of the CNS in a sustained manner. These findings may be helpful for contributing to possible treatments in patients with a demyelinated CNS, such as in multiple sclerosis (MS).

WATER RELATIONS AND TRANSPLANTING CALIFORNIA SAGEBRUSH

*Patricia Iloure, Peter Bowler, and Jenny Liou,
University of California, Irvine*

This project will monitor the water relations of California Sagebrush (*Artemisia californica*) through its seasonal physiological condition from full activity in the winter months to dormancy in the summer by measuring Plant Moisture Stress (PMS) using a pressure bomb. To gain an understanding of the water relations in plants transplanted for restoration purposes as compared with those in naturally occurring wild stands, plant water pressure was measured in study plants from wild stands, shrubs dug up and transplanted from the wild (*ésalvagedí*), plants grown commercially from wild seed and planted at least a year before, and in more recent transplants. The experiment is being conducted at the University of California, Irvine (UCI) campus restoration site adjacent the UC Natural Reserve System's San Joaquin Marsh Reserve. The experiment consists of taking foliar Plant Moisture Stress measurements from different *A. californica* stands from various restoration areas of differing ages at the site. PMS is measured because this variable signifies the degree to which a transplant has recovered from transplantation shock and achieved plant water relations comparable to those of natural control shrubs. This experiment is expected to help better understand the optimal transplanting procedure for a seasonally dimorphic species like the California sagebrush. Earlier data has revealed that transplanting *A. californica* at the beginning of the winter seasonal shift to physiological activity when it has its winter leaves yields a higher survival rate than transplanting this species in the summer when winter leaves are absent and it is less physiologically active. Observing and comparing plant moisture stress over an annual physiological cycle in commercially grown container plants, shrubs transplanted from natural stands, and in naturally occurring control plants will provide a new understanding of how seasonally dimorphic shrubs adapt to being transplanted in restoration.

MOBILIZATION OF STEM AND PROGENITOR CELLS BY THE UPREGULATION OF THE TRANSFERRIN GENE IN THE BRAIN

*Elliot Olaniyan, Paul M. Zhao, Florean Guilleau, Jean De Vellis and Araceli Espinosa de los Monteros-Jeffrey,
Department of Psychiatry and Biobehavioral Sciences,
University of California, Los Angeles*

Iron, which is essential for life, is transported by transferrin (Tf). This glycoprotein plays a key role in the growth, survival, and differentiation of all mammalian normal cells. Previously it was demonstrated that Tf plays an essential role in the maturation of oligodendrocytes (OL). In the central nervous system (CNS), the choroid plexus, and oligodendrocytes produce Tf. We previously showed that Tf directly upregulates the expression of the myelin basic protein gene (MBP); a major component of myelin. Moreover, Tf deficiency in the brain results in hypomyelination. In our present work, we studied the impact of a constant over expression of the human Tf gene, we examined two human transferrin transgenic (Tg) mice: the C57B6/D2 (Line-801) and C57B6/SJL (line-813), which were generated using an 80 Kb human genomic fragment. Both lines have a high expression of the transgene in brain and had a normal white matter. We observed many HTf expressing interfascicular OLs among myelinated axons. HTf and nestin, a stem/progenitor marker, colocalized in some cells in the subventricular zone. Thus, a constant upregulation of Tf elicits the formation of new OL. We also

found a high expression of Sox 2 in the SVZ and in the white matter. Sox 2 is a stem cell marker, therefore, Tf acts on a pool of endogenous stem and progenitor cells by mobilizing them from the ventricular wall into the parenchyma. These cells then migrate specifically into the white matter, mature and myelinate demyelinated axons in cases such as in multiple sclerosis.

PATRICIA ILOURE

Senior, Biological Sciences
UC Irvine

Mentor: Dr. Peter Bowler
Educational/Career Goal:
Ph.D. in Biology

ELLIOT OLANIYAN

Junior, Neuroscience
UC Los Angeles

Mentor: Dr. Araceli Espinoza
Educational/Career Goal:
Ph.D. in Neuroscience

"Thanks to the CAMP Symposium, I truly have a desire to continue on to graduate school. I have touched the subject before, but I just needed that push, which is what the conference gave me. Just being in the ambience of fellow students who had the same goals in life was a wonderful opportunity."

—Cynthia Carter, Special Merit in Research Awardee, UC Riverside

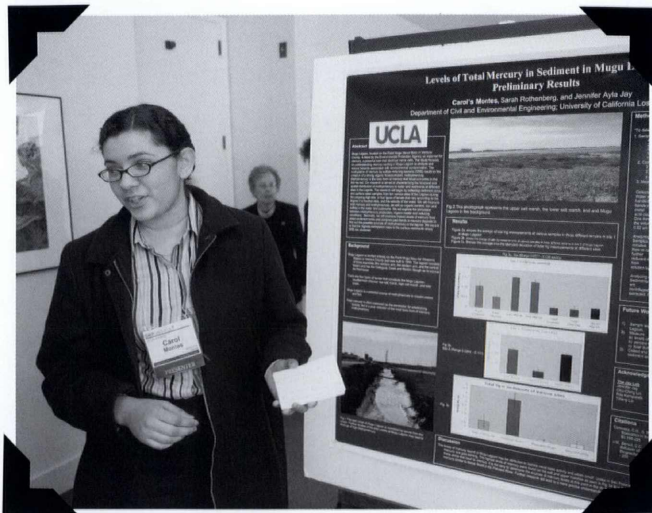
Today, more CAMP students than ever before have the Ph.D. as their goal.



"I thought the symposium was not only great practice for a skill (presenting) that I'll eventually have to develop as a researcher but it was also a really great opportunity to learn how to network, which is something I had no clue how to do."

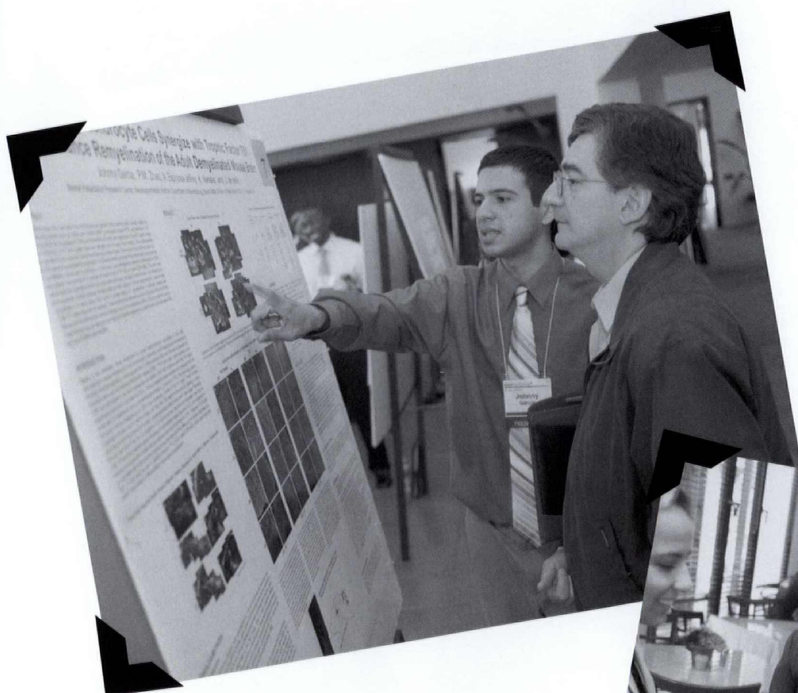
—Victoria Vasquez, UC Davis, Oral Presenter, Biological Sciences





"I had a great time at the CAMP Symposium and I am very glad to have been a part of it. It was a great opportunity to meet with other CAMP students and advisors and learn about their programs and research projects. With the warm atmosphere and surroundings, I was able to talk to most of the students presenting as well as the faculty. Watching the presentations of other students and being able to present myself was a great learning experience. It was also nice to think that I was able to do two great things at the same time: share knowledge on the type of research being conducted at UCSD and practice my public speaking skills. I found the graduate panel session to very helpful and insightful, especially to someone like me who is getting closer and closer to applying to graduate school. The panel's advice really helped me put into perspective the scope of graduate school. The symposium was everything I could have imagined and more."

—Nicholas Gastelum, Oral Presenter, Physical Sciences, UC San Diego



In 2004, the University of California awarded 1,132 B.S. degrees in STEM to underrepresented minorities systemwide.



Physical Sciences/Engineering – Oral Presentations

THE EFFECT OF INFLAMMATION/INFECTION ON THE CONCENTRATION OF CARBON MONOXIDE IN HUMAN BREATH: A CASE STUDY

Yanina Barrera, Professor Donald Blake, Department
of Chemistry, University of California, Irvine

Human breath studies have shown that chronic inflammation of the respiratory tract is associated with an increase in the levels of breath carbon monoxide. However, little is known about the effect of inflammation/infection and associated stress attributed to surgery or nonrespiratory illness on breath carbon monoxide. In this study we report the results of a case study that examined the changes in breath carbon monoxide concentrations of a prostate cancer patient before and after surgery. Co-temporal ambient and breath samples were collected in 2-L electropolished stainless steel canisters and analyzed using a Gas Chromatography-Flame Ionization Detector (GC-FID) system. A total of 20 pairs of breath/room samples were collected during the month prior to surgery and 45 breath/room samples were collected during the three months following surgery. Three instances of intense inflammation were observed during the study. Each of the three instances were accompanied by enhanced levels of CO (breath $[\text{CO}]$ -room $[\text{CO}]$). The patient's CO increased by as much as 71% above baseline during the 4 days following prostate surgery. Two days following a second surgery to remove an abscess the CO increased by 90% above baseline. Finally, during a third episode of fever and inflammation the patient's CO reached 68% above the baseline mean. These results indicate that non-respiratory inflammation/infection and associated inflammatory stress increase concentrations of exhaled CO . The use of breath gas measurements to non-invasively assess inflammation in humans seems highly applicable. However, additional studies are needed to assess the reliability and specificity of breath inflammation markers.

YANINA BARRERA

Sophomore, Chemical Engineering
UC Irvine

Mentor: Dr. Donald Blake

Educational/Career Goal: Ph.D.

MIGUEL BUENROSTRO

Senior, Biochemistry
UC Santa Barbara

Mentor: Dr. Robert Little

Educational/Career Goal: Ph.D.

EXPLORING THE HALOGEN TRANSFER PHENOMENON

Miguel Buenrostro, Biochemistry, University of
California Santa Barbara

Research Mentor: Arup Maiti, Research Director:

R. Daniel Little, Department of Chemistry and
Biochemistry University of California, Santa Barbara

It has been found that the diradicals chemistry can produce exceptionally useful compounds. Such chemistry may be used to produce various natural products such as Taxol, which is known as an anticancer compound that is currently being used in medicine today to treat various forms of cancer. The Little group has pioneered the diradicals use in organic synthesis and in the exploration of a variety of mechanistic themes, one of which is the intramolecular atom transfer cyclization reaction. These reactive diradicals are generated and studied/used in situ, and most often form bicyclic diazenes. Diazene assembly involves the fulvene formation, Diels-Alder cycloaddition, reduction of the pi-bond in the two-carbon bridge, and conversion of the biscarbamate to the diazene linkage. Diazene's can be generated both thermally and photochemically to generate TMM diyls. These TMM diyls then undergo atom transfer in the 1,5 and 1,6-atom transfer to construct polycyclic ring systems. Atom transfer reactions are highly effective for 5 and 6 membered rings however a great deal of difficulty is presented for atom transfer reactions of medium sized 7 and 8 member rings. My research focus has been the development of these medium sized rings for atom and halogen transfer reactions. A secondary aspect of my research also involves the exploration of transannular steric repulsion and ring strain effects. The development of new methods to effectively construct such ring systems could be useful to the synthetic chemist in the construction of various natural products such as phorbol, aphidocolin, and various other bioactive compounds. Completion of the proposed research will provide a solid and reliable foundation upon which to rest a host of future investigations.

MULTIPLE FUEL ANALYSIS OF A REDUCED-SCALE ROTARY ENGINE

Andrew S. Cardes and David C. Walther, PhD,
Mechanical Engineering, University of California,
Berkeley

The recent development of small-scale rotary engines as an alternative source of portable energy allows several advantages over current battery technology. Improvements include lower weight, higher energy output, and the ability to use multiple fuels for power generation. The purpose of this study is to analyze and optimize reduced-scale rotary engine performance using heavy fuels, alcohol fuels, and gasoline fuels. In addition to varying fuel types, engine load and air/fuel mixtures are altered to increase engine power output and efficiency. It is expected that under ideal ignition conditions heavy fuel and gasoline will produce high power output efficiently with limited air/fuel mixtures. It is also expected that alcohol fuels will allow for more flexible air/fuel mixtures and ignition conditions with lower power output and efficiency. This research can be applied to milli-scale and micro-scale rotary engine development. Future plans include optimization of ignition timing and placement, air induction, and fuel/oil mixtures.

ANDREW CARDES

Senior, Mechanical
Engineering
UC Berkeley

Mentor: Dr. David C. Walther
Educational/Career Goal:
Ph.D. in Engineering and
become a Professor

ARMANDO HERNANDEZ

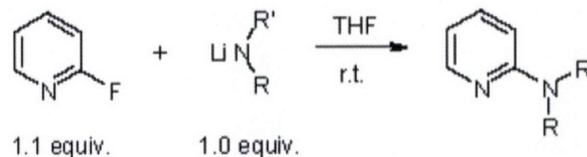
Senior, Chemistry/
Biochemistry
UC Santa Cruz

Mentor: Dr. Bakthan Singaram
Educational/Career Goal:
Ph.D.

THE AROMATIC NUCLEOPHILIC SUBSTITUTION SUSCEPTIBILITY OF 2-FLUOROPYRIDINE TO FORM 2-AMINOPYRIDINES USING LITHIUM AMIDES AS REAGENTS

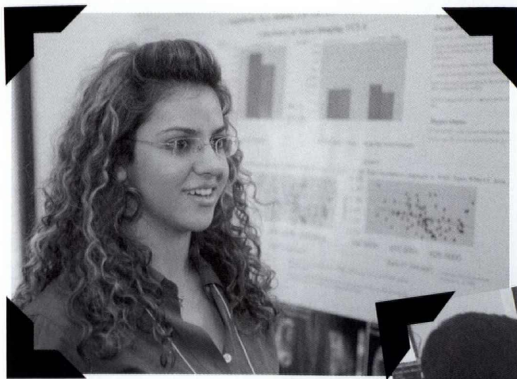
Armando R. Hernández, Lubov Pasumansky, Bakthan Singaram, Department of Chemistry and Biochemistry, University of California, Santa Cruz

2-Aminopyridines have been shown to be important precursors for the synthesis of various types of organometallic ligands, fluorescent dyes, and biologically active compounds. Although, past attempts to synthesize 2-aminopyridines from inexpensive 2-halopyridine starting material have involved the use of extreme pressure and temperature conditions or the use of expensive catalysts and reagents. Here we report the direct reaction of 2-fluoropyridine (as starting material) with lithium amides, which gives 2-aminopyridine in good yields and purity. Treatment of 1.1 equivalents of 2-fluoropyridine with 1.0 equivalents of lithium amide (using both primary and secondary amines) at room temperature affords complete conversion after two hours. As a result, various trends have been observed when comparing the product yields to the type of amines used in the reactions. This amination reaction can also be explained by using an aromatic nucleophilic substitution (S_NAr) mechanism based on the observations seen including the formation of a brightly colored Misener complex intermediate, which supports the S_NAr postulate. The same procedure was also attempted using 2-chloro- and 2-bromopyridines in forming substituted products with the same lithium amide reagents; however, this process resulted in a ring opening reaction instead.



“The CAMP Symposium was overall an enriching experience that gave me an opportunity to talk to faculty and meet student researchers from all UC campuses. I developed confidence in my research as I shared my work with others, but also this was a chance for me to exchange knowledge with students who share similar interests, as well as an opportunity to develop friendships.”

—Kristalia Williams, UC Davis, Poster Presenter, Biological/Life Sciences



Elma Gonzalez, UCLA Professor of Biology and founding CAMP Faculty Director, was awarded the SACNAS 2004 Distinguished Scientist Award.



"I just wanted to say it was an excellent symposium. The Beckman Center is such a beautiful place to hold such an honorary event. Thank you so much for all your hard work. We really appreciate it."

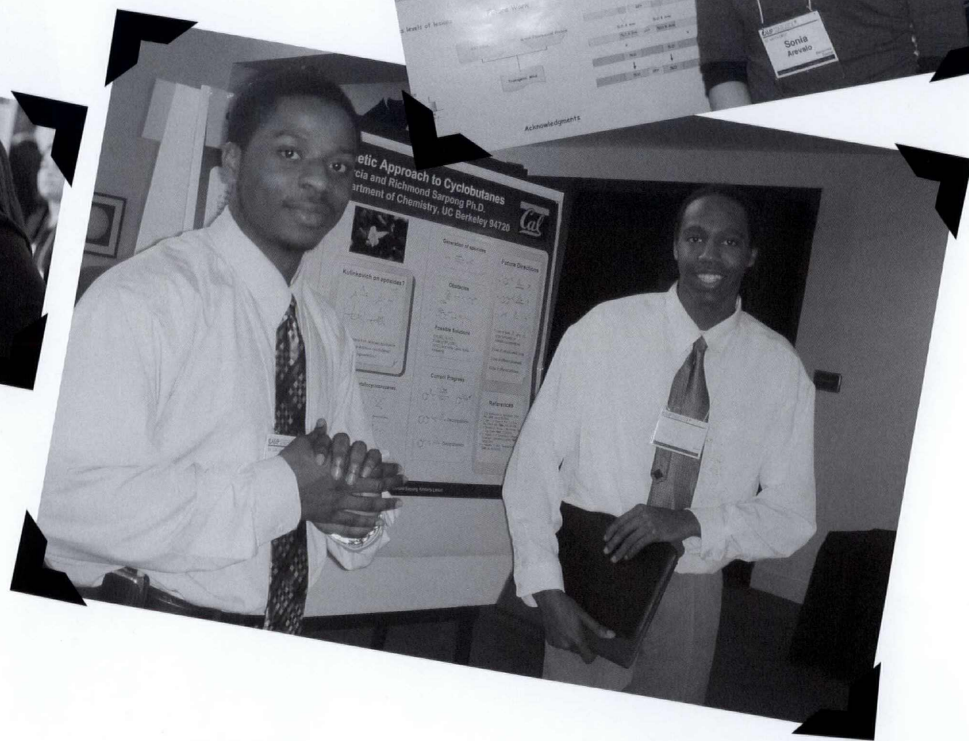
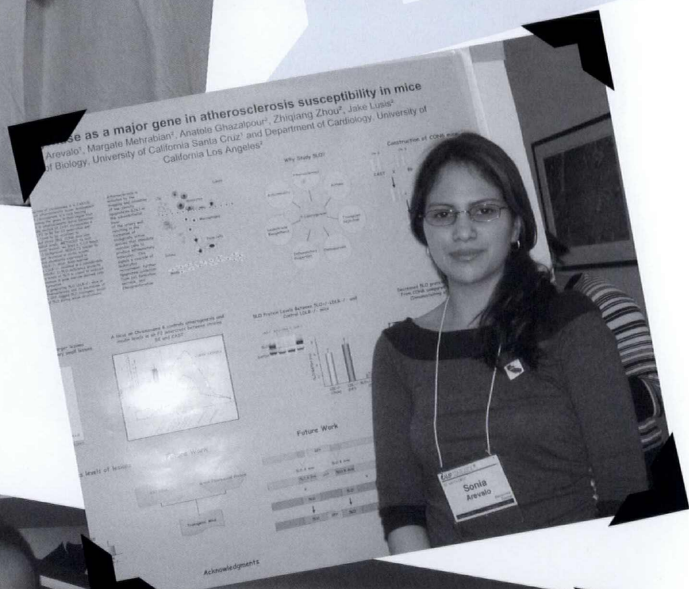
—Cassandra Fong, UC Davis, CAMP Program Assistant





18 UC faculty and research scientists served as judges.

Each UC partner campus took home at least one award for Special Merit in Research.



“The CAMP Symposium provides undergraduates with a forum to present research findings in a supportive setting that is without the pressure often found in large conferences of international societies. This CAMP event provides an invaluable opportunity for students to practice presenting posters and talks among their peers, thus better preparing them for graduate study. I hope that the experience of the participating CAMP students will bolster their confidence for future presentations that they will make in their lives.”

—Dr. Elizabeth Yoder, UC San Diego

Physical Sciences – Poster Presentations

ESTIMATION OF COMMUTER ON-BOARD PARTICULATE EXPOSURE WHILE TRAVELING ON MAX TRANSIT BUSES

Cynthia Carter, Department of Mechanical Engineering, University of California, Riverside, Dr. Melinda Lalor, and Davyda Hammond, Department of Civil and Environmental University of Alabama, Birmingham.

Air pollution causes several harmful health effects, including respiratory problems and lung cancer. One specific pollutant, fine particulate matter, has recently become a pollutant of major concern with the EPA issuing new standards for PM 2.5. Many transit authorities around the country are advocating the use of the transit system to help reduce not only traffic, but also air pollution. Research has shown compressed natural gas buses are better on the environment than the old diesel buses, but few studies have been done to compare the newly-designed diesel engine buses. This study's purpose is to provide information on the on-board particulate exposure of commuters while riding different bus types. On-board bus particle exposures were measured using a TSI P-Trak Ultrafine Particle Counter. Instrument sampling was started with recharged batteries everyday. The alcohol wick was soaked before each data test run. Enroute the instrument would record the particle concentration inside of the bus, while I recorded bus changes, i.e. passenger load, idling, acceleration, and traffic status during the mornings and afternoons. Even though there were many factors that affected our results—Ozone Alert Days, weather, air conditioning, traffic and window positioning—each bus type had its own contribution to the particle count concentration in interesting ways. A significant reduction of particle count occurred when the bus windows were closed. Overall, the low-sulfur diesel buses consistently had the lowest particle counts compared to compressed natural gas and old diesel buses. This study provides evidence that the new low-sulfur diesel engines should be considered for the “new face of transportation.”

EXTREME ULTRAVIOLET (EUV) METROLOGY

Franklin Dollar and Eric Gullikson, PhD, Center for X-Ray Optics; Lawrence Berkeley National Labs, University of California, Berkeley

EUV has applications in lithography, microscopy, and astronomy that require EUV metrology. As EUV optical systems become more complex, the need for EUV metrology grows. Only multilayer coatings can reflect EUV efficiently, however these coatings must be absolutely uniform in peak reflectivity. Using Beamline 6.3.2 at the Advanced Light Source, measurements can be made to an accuracy of a tenth of a percent. By adjusting the gamma of multilayer coatings, these measurements will show the uniformity of deposition for each element. The measurements from Beamline 6.3.2 allow for corrections to be made in the coating process. The measurements made show that the coating process can be brought to a uniformity that deviates by tenths of an angstrom. Using these coating techniques a pair of curved optics were made for an endstation at Beamline 12, where lithography experiments were performed. The optics undulate to allow a less coherent light which is needed for these experiments to progress.

CYNTHIA CARTER

Junior, Mechanical Engineering
UC Riverside

Mentor: Dr. Melinda Lalor
Educational/Career Goal:
Masters/Ph.D. in Engineering
(see profile p. 34)

FRANKLIN DOLLAR

Junior, Engineering Physics
UC Berkeley

Mentor: Dr. David Attwood
Educational/Career Goal: Ph.D.
in Physics or Applied Science
& Technology; run a lab and
become a professor

BIOMECHANICAL COMPARISON OF TRANSFORAMINAL LUMBAR INTERBODY FUSION AND POSTERIOR LUMBAR INTERBODY FUSION IN THE IMMEDIATE POST-OPERATIVE RANGE OF MOTION

William Muiru and Christian Puttlitz, Ph.D.,
Orthopaedic Biomechanics Laboratory, University of California, San Francisco

Transforaminal Lumbar Interbody Fusion (TLIF) and Posterior Lumbar Interbody Fusion (PLIF) are currently the most common techniques for the placement of interbody grafts in the lumbar spine. To determine the difference in the acute post-operative range of motion (ROM) between the two techniques, fifteen human lumbar spines (L1-L5) underwent a sequential TLIF (n=8) or PLIF (n=7) at one and two levels. Pure moments (torques) were applied to each specimen on the appropriate anatomical axis to induce motion in flexion/extension, lateral bending and axial rotation. Loads were applied quasi-statically in 1.0N-m increments to a maximum of 4.0N-m. Our results indicate that neither procedure provides significant advantage in stability when posterior instrumentation is used. However, TLIF has less extensive surgical dissection and preserves more posterior elements than PLIF. Therefore, our data suggests that TLIF may be a better surgical option for most patients.

WILLIAM MUIRU

Senior, Biological Systems Engineering
UC Davis

Mentor: Dr. Christian Puttlitz
Educational/Career Goal:
Attend graduate school and study biomechanics. Gain experience in the industry and then return to academia to teach and do research.

CESAR RIVADENEYRA

Junior, Mechanical & Aerospace Engineering, UC Irvine
Mentor: Dr. Jaret Matthews
Educational/Career Goal:
Attend the California Institute of Technology to obtain a Ph.D. in Aerospace Engineering. Work for one of NASA's research center designing spacecraft.

HYDROTHERMAL VENT SAMPLER: A SEARCH FOR BIOMASS IN THE EXTREME ENVIRONMENT OF UNDERWATER VOLCANOES

César Rivadeneira Mentor: Alberto Behar and Jaret Matthews, University of California, Irvine

The main purpose of this research is to find existence of biomass under these extreme conditions, and, further more, to add to the theory of evolution and the creation of life through these research findings. Vents are simply put underwater volcano openings located at the bottom of the sea. The conditions at these locations are considerably extreme with pressures of up to 50,000 Psi, and enormous temperature gradients. The temperature of the water near these vents is around 400 C while that of the surrounding water is about -3 C. The extremity of these conditions makes it hard to estimate the existence of life in those environments. In order to find whether such existence does happens, we need to search for biomass inside these vents. The vent sampler is a device that has the purpose of safely and accurately collecting this biomass for examination. This sampler is constituted of a series of filters of the order of 101 microns in size, as well, as heaters in order to maintain the biomass alive. Since this is a 3-year project, it has not concluded yet, however, during the time I contributed to this project I worked with the mechanical design of this sampler device including the selection, assembly, and testing of the various subsystems.

"The symposium was quite an eye opening experience. I wish that more students understood the immense value of experiences like the symposium in our journey towards the completion of our goals and dreams. Personally, I learned so much about myself that I could critique myself constructively, and proud of what I had accomplished. I want to do it again. I want the world to see what I can accomplish and I feel that with practice I will gain the confidence and skills necessary to do so. Jacquie [Dr. Jacqueline Azize-Brewer, CAMP coordinator] I can't thank you, CAMP and Academic Enrichment Program enough for this great opportunity. The food was great, the agenda was great. I learned a lot."

—Maria Tobar, Oral Presenter, Biological Sciences, UC San Diego

How To Get Into Graduate School

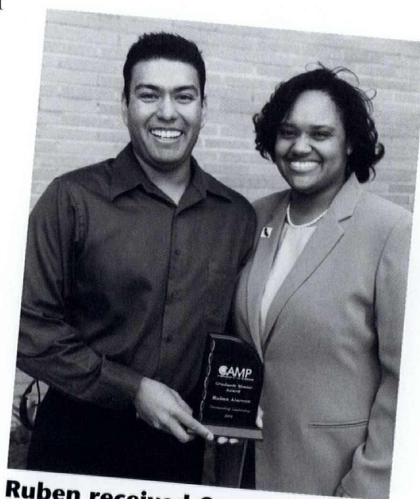
10 Tips

from Ruben Alarcón, Ph.D.

- 1** Make sure graduate school/research is for you. Participate in summer programs or undergraduate research to figure out what you like. Graduate school is not for the weak. You need to love it, or you will end up hating it!
- 2** Start putting your “package” together ASAP! Graduate school look at: a) Grades; b) GRE test scores; c) Personal statement/research objectives; d) Research experience; e) awards, publications, presentations, and other accomplishments. If you are lacking in one area make sure your other areas are strong!
- 3** Read the field you want to enter; you will know who and what is on the cutting edge.
- 4** Take the GRE in the spring before you are planning to apply to grad school. Study at least for one quarter!
- 5** Contact 5-6 professors you would like to work with at least one month before the application is due. In graduate school you work under the direction of a faculty mentor. Pick someone whose work excites you. In your email let them know: a) who you are; b) your research interests; and c) ask if they have room in their lab for you.
- 6** When choosing a graduate school, remember location: if you don't think you would feel comfortable living in the city where the school is located, what makes you think you can go to grad school there?
- 7** Work on your personal statement/research interest for at least 4-6 weeks. The better your statement the more likely you will get accepted to the school of your choice. Fellowships also rely heavily on personal statements and can make the difference between receiving a fellowship or having to teach to pay your way through graduate school.
- 8** I've applied to grad school now what? You need to visit the school. Most schools have recruitment weekends so you can meet students and faculty. You need to make sure that your advisor is someone you are compatible with. He/she can be the greatest scientist on the planet but if you don't feel comfortable talking with him/her you will have a hard time learning from them. Meet the students that will be your cohort. They will be your friends, teachers, counselors, etc. You can't make it without them!
- 9** Money! You need to make sure that you will have financial support for the entire graduate program. Support can be teaching assistantships, research assistantships, or fellowships. Fellowships are nice because you will have plenty of time to do your work. However, they are very competitive so you need to apply early (NSF & Ford fellowships are some of the best in the sciences). Regardless, get it in writing that you will have “X” years of TA support and “Y” years of fellowship support.
- 10** Good luck! You are now a grad student. You will now become a coffee addict and suffer from insomnia worrying about all the work you need to do!

Alum Update

Dr. Ruben Alarcón is currently a Postdoctoral Fellow at the Center for Insect Science, Department of Ecology and Evolutionary Biology, University of Arizona, Tucson. Dr. Alarcón is conducting research in the lab of Dr. Judie Bronstein, and is interested in mutualistic plant and insect interactions. He was a CAMP mentor during his undergraduate career at UCI. He obtained several summer research internships (including at Harvard) that laid the foundation for graduate studies. He won a \$5,000 renewable scholarship from The American Chemical Society's Minority Scholarship Program, among others. Alarcón completed a Ph.D. in Biology in 2004 at UC Riverside.

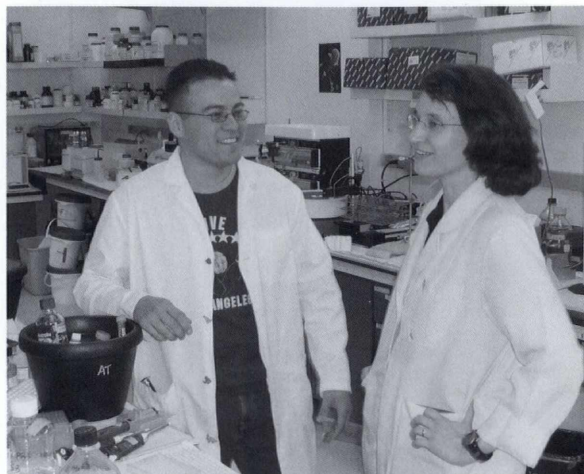


Ruben received Outstanding Graduate Mentor award from Teresa Cofield, UCR CAMP Coordinator.

UCI Alumnus Peter Velázquez Completes the Ph.D. at UCLA

Peter Velázquez is among the new Ph.D.s emerging from the University of California who had their first taste of research through the CAMP program. Velázquez was an engaged undergraduate, a dedicated student and CAMP participant who mentored and tutored his peers. He did research under the supervision of Dr. Andrea Tenner, who influenced his preparation for graduate education. Velázquez is currently a postdoctoral fellow at the Skirball Institute for Biomolecular Medicine in New York. As you will discover in the “Q&A” he uses a colorful metaphor of “upstream thinking” to describe his undergraduate career, which led him to conduct and present his research in far flung locations such as Paris, Montreal, Boston, Orlando, Saint Louis and Washington, D.C.

In March 2005 he completed a doctoral degree in cellular and molecular pathology at UCLA. He earned an M.A. in biology and biomedical sciences, immunology, at Washington University, Saint Louis, Missouri (2001); and a B.S. in Biology, with honors, at UC Irvine (1997). While pursuing the bachelor’s degree, Velázquez was a CAMP summer research scholar (1994 and 1995), and received a CAMP travel award in 1996. That was nearly a decade ago. This



Peter Velázquez and Suzanne Bohlson Ph.D. UCI Molecular Biology and Biochemistry, Tenner Lab.

year he served on the EDGE (Enhancing Diversity through Graduate Education) committee. He was also the co-chair and founding member of the UCLA Cellular and Molecular Pathology Science Retreat (2002-04). Our heartfelt congratulations to Dr. Peter Velázquez, role model extraordinaire!

Q&A

with Peter Velázquez

Q: To whom or to what do you attribute your transition to graduate school?

PV: Having support from great people like Andrea Tenner really solidified my interest in science. My support while at UCI came from such a diverse group of people that also included the BRIDGE program, Dr. Christine Moseley, Dr. Andrea Tenner, Dr. David Cribbs, and Kika Friend. This truly highlights the fact that one person’s accomplishments is the result of the passion and interest of many. Emil R. Unanue, M.D. of Washington University and Jonathan Braun of UCLA have by far been the most inspirational and supportive professionally since my time at UCI.

Q: Who in your path to the Ph.D. stands out as a great role model and mentor?

PV: I do not have a single role model or greatest mentor as I am inspired by all of the people I choose to keep in my life and those I meet in the world around me.

Q: How did you select your area of biology—what led to your identifying this particular aspect of the life sciences?

PV: I did not choose science. It chose me. It just happened. “Upstream thinking” is

what probably got my initial interest. I wanted to do something that I knew would simply help people. In brief, "upstream thinking" works like this: imagine you are walking by a rapid river and you see a person being swept down the river. You dive in to save them. Then another person... so you dive in again. This repeats itself, so much so, that you do not have the time to walk upstream to see what the heck is throwing all these people in! I knew I enjoyed biology during my second year at Irvine (yes, I was undeclared. Ha!!). Scientific investigation is upstream thinking while medicine is more the lifeguard person pulling people from the river. Whether a person chooses science, art or whatever... I think if you just do what you love and always keep an eye out to help your fellow human being, we will all be better off.

Q: What are your career goals, short- and long-term?

PV: Ultimately, I want to be a good scientist and hope I am doing something for the better of all peoples. I simply try to go into work enjoying what I do and, we all know that, on a daily basis, that is easier said than done. Of course, ultimately I just want to be a good son, brother, friend, colleague, mentor and someday, father.

Q: Whom do you most admire?

PV: My parents and grandparents of course, they are the leaders of the center part of my life, my family. Through their patience and compassion they have shown me, by example, the meaning and utility of giving of one's self for the benefit of others. Ideologically, that is how I view my place in my profession.

Peter Velázquez, Ph.D.

Education

2005 Doctorate of Philosophy: Cellular and Molecular Pathology.
University of California, Los Angeles.

2001 Master of Arts: Biology and Biomedical Sciences, Immunology.
Washington University, Saint Louis, MO.

1997 Bachelor of Science: Biology, with Honors.
University of California, Irvine.

Research Experience

2002-Present University of California, Los Angeles.
Doctoral Candidate, Department of Pathology and Laboratory Medicine
Advisor: Jonathan Braun, M.D. Ph.D. Professor and Chair
Investigate B-cell development and function aimed at understanding mucosal lymphocyte homeostasis.

2002-2002 Agensys, Inc (formerly Urogenesys, Inc.) Santa Monica, CA.
Research Associate II, Gene Validation
Supervisor: Mary Faris, Ph.D. Staff Scientist

Independently designed and conducted cell-based experiments to identify the function of proprietary gene products as related to Prostate Cancer. Additionally, trained research associates in GLP, sterile technique, experimental design, and data analysis.

2000-2000 Washington University School of Medicine. St. Louis, Missouri.
Graduate Fellow, Department of Pathology and Immunology.
Advisor: Emil R. Unanue, M.D. Mallinkrodt Professor and Chair
Utilized in vivo and in vitro experimental systems investigating biology of Type I diabetes and resistance to L. Monocytogenes.

1993-1997 University of California, Irvine.
Undergraduate Research Associate, Molecular Biology and Biochemistry.
Advisor: Andrea J. Tenner, Ph.D. Professor and Associate Director of Center for Immunology
Independently designed, conducted, and analyzed experiments aimed at elucidating the involvement

of Complement in Alzheimer Disease pathology. Additionally, maintained collaborative relationships with multiple laboratories.

Teaching Experience

2003-Present University of California, Los Angeles.
 Research Mentor, Undergraduate Research Center for Life and Physical Sciences.
Provide seminars for scientific abstract preparation, poster and oral presentation, writing journal articles, applying to graduate school, as well as individualized mentor ship in these areas.

1997 University of California, Irvine.
 Teaching Assistant, Center for Educational Partnerships.
Collaboratively developed and taught a pilot bilingual summer science academy.

Scientific Reviewer

2003 Cellular Immunology. International journal publishing cellular and clinical findings in immunology
 UCLA Undergraduate Science Journal. Multi-disciplinary journal for UCLA undergraduate honors.

Professional Presentations

2004 International Congress in Immunology / Federation of Clinical Immunology Society. Montreal, Canada. Poster Presentation.
 Experimental Biology/American Association of Immunology. Washington, D.C.
 Oral Presentation: "Deconstructing Mucosal B-cells: ILFs are Distinguished by Developmental Requirements and Phenotypic Traits."
2003 29th Annual La Jolla Immunology Conference. La Jolla, CA. Poster Presentation.
 International Digestive Disease Week. Orlando, Florida. Oral Presentation: "Phenotype and Requirements for IEL B-cells."
 Federation of Clinical Immunology Society. Paris, France. Poster Presentation.
 Keystone Symposia on Mucosal Inflammation. Keystone, Colorado. Poster Presentation.
 CURE: Digestive Disease Research Center Annual Conference. Los Angeles, California. Poster Presentation.

2001 Washington University Department of Pathology, Works in Progress. Saint Louis, Missouri. Oral Presentation: "On the Role of CD4+ T-cells in Resistance to *Listeria Monocytogenes*."

1996 XVI International Complement Workshop. Boston, Massachusetts. Oral Presentation: "Structural Properties of β -amyloid Required for Complement Activation."

Fellowships and Awards

2004 NIH National Research and Service Award
 PI: Peter Velázquez. IEL B-cells: Phenotype and Developmental Requirements.
 American Association of Immunologists Minority Travel Award
 Federation of Clinical Immunology Societies Travel Award
 UCLA Cellular and Molecular Pathology Travel Award
 National Science Foundation: SREB-AGEP Travel Award
2003 NIH Graduate Fellowship. Research Supplement for Underrepresented Minorities. (NIDDK. PI: Stephen R. Targan). 9/03-6/04.
 Federation of Clinical Immunology Societies Millennium Travel Award
 UCLA Cellular and Molecular Pathology Travel Award
2002 NSF Graduate Research Fellowship, Honorable Mention
1997 University of California at Irvine. Dean's Academic Achievement and Service Award
1996 NIH Undergraduate Fellowship. Research Supplement for Underrepresented Minorities. (NIAID. PI: Carl W. Cotman). 9/96-6/97
 California Alliance for Minority Participation (CAMP) Scientific Travel Award
 Ronald E. McNair Scholar
1995 University of California at Irvine. Excellence in Research in the Biological Sciences
 California Alliance for Minority Participation (CAMP) Summer Research Scholar
1994 California Alliance for Minority Participation (CAMP) Summer Research Scholar.

MORE Profiles & Alumni Updates

UC DAVIS

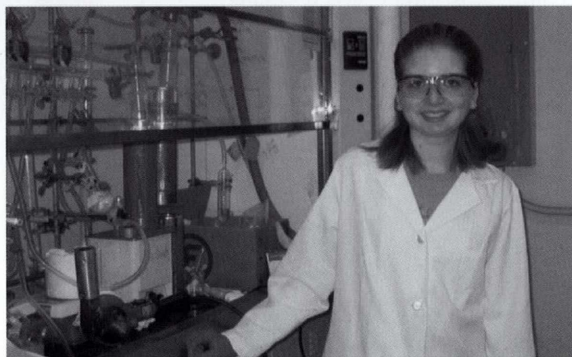
CATHERINE COX

- UC Davis, Junior
- Chemistry Major

Catherine Cox has won recognition from the chemistry department for academic excellence. She received the Excellence in the Chemistry Major award (2002 and 2003) as both a freshman and a sophomore. She carries a 3.79 GPA. Her commitment to the discipline is also seen in her work as an undergraduate researcher in the lab of Professor Susan Kauzlarich, her mentor. Catherine's objective through the 2004-05 academic year has been "to continue research in the synthesis of silicon nanoparticles." She adds, "I plan to complete my research paper on this topic for publication."

In addition to her full class schedule, Catherine is an active member of MURPPS (Mentorships for Undergraduate Research Participants in the Mathematical and Physical Sciences), a program that collaborates with CAMP. She is considered a model student by CAMP program staff, who "anticipate great things for her." For her dedication and exemplary achievements, Catherine was selected to receive the CAMP Statewide Undergraduate Scholarship for 2004-05.

Volunteer work is also a priority. She donates her time to the John Muir Medical Center and to other civic initiatives. In 2002, she won the Girl



Scout Gold Award, the highest honor in Girl Scouts, for developing a website on burial records for eight cemeteries in Costa County. For her career goal, Catherine states, "I would like to explore my career options after I graduate before I decide if I would like to pursue my education further—whether that entails graduate school or pharmaceutical school." She is keeping her options open, and has not yet firmly decided on a career path. However, a research position in a laboratory or becoming a pharmacist are definitely open for consideration.

Regarding research as an undergraduate, she

"Catherine Cox is an outstanding undergraduate. She is a fantastic role model for other students. She has been an asset to my research group and has been able to contribute to complex projects such as the synthesis of Si nanoparticles."

—Professor Susan M. Kauzlarich, Department of Chemistry, Faculty Mentor

says, “the experience has been incredibly valuable.” For Catherine Cox, “Working in the research lab is a better lab experience than what regular undergraduate courses can provide.” She explains that it “requires problem solving and thinking to understand what is going on because the experiment has not already been completed, analyzed, and understood hundreds of times.” She says that although working in the lab occupies a lot of time, it has not hurt her ability to focus on classes and grades. She emphasizes, “My research group understands that my classes come first.”



DIANA LIZARRAGA
 ■ UC Davis Alumna and
 CAMP Scholar
 ■ Program Director,
 Leadership Excellence
 through Advanced Degrees
 (UC LEADS)
 UC Berkeley

During her undergraduate career Diana Lizarraga was a CAMP Scholar, McNair Scholar, Hugh Edmondson Fellow, MESA participant, and in addition to her academic activities, played on the field hockey team. After graduation in 1999, she spent two years at Hewlett Packard, where she earned the prestigious MVP award in 2000. She then went to work for UC Davis Graduate Studies, and then on to Berkeley. Diana will be applying for her Ph.D. in Information Systems within the next few years. Her husband, Jaime, was also in CAMP at UC Davis, through the MURALS program.

Lizarraga writes (via email):

“CAMP gave me funding when I was at Sacramento City Community College to take off one night a week from my waitressing job to get free chemistry tutoring (they paid me to get tutoring... it made a difference). I consider myself to be a pipeline child who went through MESA, CAMP, McNair, EOP (Educational Opportunity Program), and Hugh Edmondson to help me achieve my goals. I was a CAMP Scholar, and completed four undergraduate research projects in Pathology, Animal Genetics, Reproductive Biology, and Science Education.

“I earned a B.S. in Agricultural Systems and Environment with an emphasis on



information and communication systems with a specialty in animal science. I also got a minor in agricultural education. I married another McNair scholar and we opened up a small biotech company (along with another partner) in Davis right before I graduated from UC Davis in 1999. It is an automated DNA sequencing facility. I earned a Master’s degree in Human Resources and Organizational Development with an emphasis in Leadership at the University of San Francisco.

“At Cal I am now a Program Director and I continue to be a diversity evangelist through my professional organizations such as Sigma Xi, SACNAS, CUR, and AAUW. I also work on the California Forum for Diversity in Graduate Education. There are many CAMP alumni who are proud of this community and especially its future potential.

“Running a Diversity Undergraduate Research Program in the Sciences gives me an opportunity to help my students understand the value of research and instill confidence in them that they too can be successful in science. In addition to research skills, my program focuses on community building, behavioral competencies, and leadership development. Personally, It is an ideal way for me to give back to everyone who helped me leave a nine-year career as a food server to a position where I can positively influence the lives of our future leaders.”

CHAD STERLING
 ■ UC Davis Alumnus
 ■ Graduate Student, Computer Science
 ■ Co-Chair Black Graduate and Professional Association, UC Davis

From the beginning of his undergraduate career, Chad Sterling stood out among his peers. He maintained a very high grade-point average in the demanding major of Computer Science. He served as an ASUCD senator and worked as a resident advisor. He was a CAMP supported and MESA Engineering Program student, involved in the Black Engineers’ Association and traveled to many regional and national NSBE (National Society of Black Engineers) conferences. Upon graduation in June 2003, he received the Veloyce Glenn Winslow Award which honors the most outstanding graduating senior man in the areas of leadership, integrity, and service to the campus community. Chad is currently pursuing a Master’s Degree in Computer Science. He is co-chair of the newly established Black Graduate and Professional Association. In collaboration with Renée Maldonado, the Director of Student Development and Recruitment, he hopes to bring graduate student advising to the Student Center in a program called GAAAP (Graduate Academic Achievement and Advocacy Program), a student initiative



to support underrepresented students. Chad has most recently been honored as one of the distinguished winners of the 2005 Black Engineer of the Year Awards - Student Leadership Award (Graduate). This is our nation's largest gathering of black technical professionals. Recipients of these awards are innovators who demonstrate commitment to engineering, excel in leadership, are recognized for their contributions as role models and mentors, and seeking to enhance the minority presence in the technology field. This award is given annually in recognition of African-Americans who break stereotypes and truly shake up industry and academia. Award winners will celebrate during Black History Month in Baltimore, MD, to network among the nation's best and brightest technological minds. Congratulations Chad!

UC RIVERSIDE

DAVID CARDOZA

- **Ph.D. Student, Physics, fourth year, State University of New York at Stony Brook**
- **M.S. Physics, State University of New York at Stony Brook**
- **B.S. Physics, High Honors, University of California, Riverside**
- **Research Experience for Undergraduates, Department of Physics & Astronomy, University of California, Irvine**

David Cardoza was a transfer student to UC Riverside from Crafton Hills College, Yucaipa, California. He made the most of his junior and senior years, participating in undergraduate research through an REU at the Irvine campus, at the Department of Physics and Astronomy in Summer 2000. His project was "Observations of Binary Star System HD 156633." He took advantage of the counseling and encouragement provided by UCR-CAMP Coor-

dinator Teresa Cofield, who regularly hears from alumni like Cardoza, who continue on to graduate school and share their educational progress and goals.

Cardoza writes, "I am completing my fourth year at graduate school here at Stony Brook University. I received my masters degree and am currently a W. Burghardt Turner Fellow. I was selected to go to Germany last year along with 50 other graduate students from around the country to attend the 54th meeting of Nobel Laureates.

"My group here [SUNY Stony Brook] just had two papers accepted for publication. I am first author on one, and second on another.

They are: Changing Basis for Molecular Learning Control, D. Cardoza, F. Langhojer, C. Trallero, O. L. A. Monti, T. C. Weinacht, submitted to *Physical Review A*; Gaining Mechanistic Insight from Closed Loop Learning Control: The Importance of Basis in Searching the Phase Space F. Langhojer, D. Cardoza, M. Baertschy, T. C. Weinacht, submitted to *Journal of Chemical Physics*; Coherent Control of Strong Field Multiphoton Absorption in the Presence Dynamic Stark Shifts C. Trallero-Herrero, D. Cardoza, J. L. Cohen, T. C. Weinacht, submitted to *Physical Review A*.

ALISON CASTRO

- **Ph.D. Mathematics Education, University of Michigan, expected June 2006**
- **M.S. Mathematics, University of Michigan, June 2005**
- **B.A. Mathematics, 2001 University of California, Riverside**

Doctoral candidate Alison Castro admits that she didn't always love math. In fact, she "loathed" all of her high school math classes. Even when she began her freshman year at UC Riverside, she put off the math requirement to the "last possible moment." But by the end of her sophomore year, all that changed. Castro took a trigonometry course and "fell in love with it." She says that she was motivated to learn "all because of the professor and her passion and excitement."

After only two weeks in the class, Castro changed her major to mathematics. She was compelled by the goal to motivate others, to build their confidence and succeed in the classroom. "Ultimately," she says, "I want to help future teachers learn how to really teach math."

Castro pursued her desire for teaching by participating in the CAMP Teacher Prep activity, tutoring at a local elementary school. She was been actively engaged in the Community Teaching Fellows in Math and Science from January 2000 through June

2001 (or “during her junior and senior year of college”). Of this experience, she points with pride to the success of the elementary school students which she worked, preparing for district tests, emphasizing “Not a single student failed the math section.” In fact, out of a score of 25, Castro reports that her students averaged 24.5.

Castro discovered her “passion for research” at Cornell University, Mathematical and Theoretical Biology Institute. There she realized that she wanted to help teachers become more active with their students when teaching mathematics. Castro’s work at Cornell used mathematical modeling to examine the effects that teachers have on minority high school students’ learning experience in California and Arizona. She says, “Without a doubt, I can do the type of research that will make a difference in our communities.”

Castro has made presentations at Psychology of Mathematics Education, North American Chapter, “Beyond Implementation: Examining Changes in Teachers’ Lesson Planning with an Innovative Middle School Mathematics Curriculum,” coauthored with Melissa Gilbert, Dana Gosen, and Edward Silver; and the Association of Mathematics Teacher Educators and American Educational Research Association, Paper, “A Novel Practice-Based Approach To The Professional Development Of Teacher Educators” coauthored with Bob Allen; American Educational Research Association, Paper, “Examining Middle School Mathematics Teachers’ Use Of The Teacher Guide During Planning.”

CYNTHIA CARTER

- **B.S. Mechanical Engineering, Expected June 2006**
- **Honors and Awards: UCR Outstanding Academic Achievement Award; Society of Women Engineers Scholar; Second Place at College of Engineering, Industry Day Poster Presentations Fall 2004; CAMP Statewide Special Merit in Research Award, 2005 Symposium. President, UCR Society of Women Engineers**

Cynthia Carter has established a productive and busy research agenda: Scholar Intern, Summer 2005 U.S.

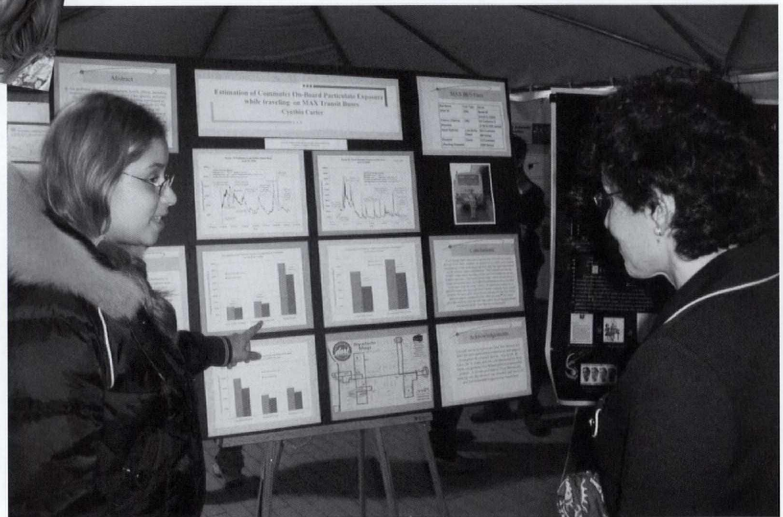


Department of Energy internship through the UC Riverside Washington Academic Program; 2004 NSF Fellowship in Birmingham Alabama, estimating the passenger exposure of particulate matter of transit buses; UCR research on how air pollution disperses among communities. Carter is working on a new research project to test the emissions of already low emitter vehicles at the College of Engineering Center for Environmental Research and Technology (CE-CERT).

What does she appreciate about UCR? “The best experience at UCR is all the wonderful opportunities that I am given — whether it is traveling across the country to do research or doing top notch research at our own College of Engineering CE-CERT.” She especially notes the people, “The faculty and staff are very supportive, and I appreciate their help.”

When it comes to the motivating factor in her life, Carter says her mother motivates her the most, and supports her decisions “100%.” She says, “We were just introduced to the idea of graduate school, and she is pushing me to get the highest education level because she knows the power of an education.”

Carter is active in two major engineering student organizations, the Society of Women Engineers, for which she serves as President, and the American Society of Mechanical Engineers. Additionally, she is an Ambassador for the UCR College of Engineering, and a member of CAMP. Future plans for Cynthia Carter include graduate education at UCR, UCD, or UCI. After graduate school, she plans to do research for the U.S. Government, and eventually worldwide research, “because air pollution is happening all over the earth.” Some day she hopes to develop another low-emitting vehicle that uses a new fuel source.



UC SAN DIEGO

SILVESTRE NELSON BRAVO

- Senior, Mechanical Engineering
- B.S. Degree June 2005
- Honors and Awards: NACME Scholarship, 2004-05; CAMP Statewide Undergraduate Scholarship, 2004; CAMP Statewide Undergraduate Research Symposium Poster Presentation Award, 2004; CAMP-UCSD Summer Research Award, 2003; SHPE Scholarship Award, 2003; UC Edison Scholar, 2002-2004

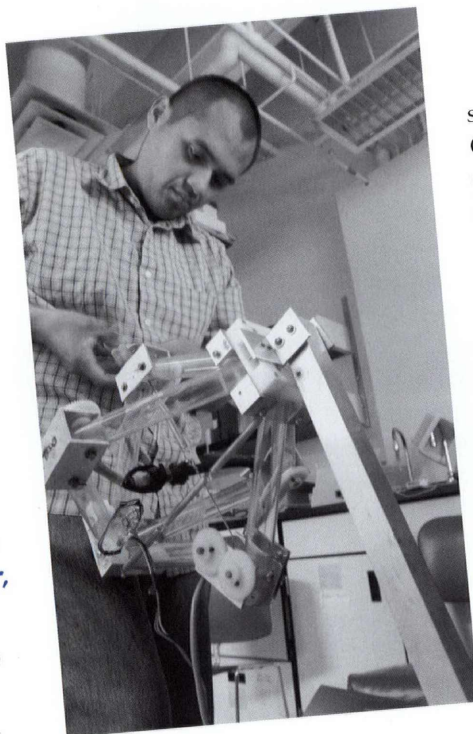
Silvestre Nelson Brave transferred to UC San Diego in 2002 from Santa Ana College, where he tutored all levels of mathematics (up to differential equations) for two years through the Math Study Center, MESA Program. He also tutored engineering physics and general chemistry, assisting bilingual students in Spanish. While at Santa Ana College, Bravo became the founder and president of the Mexican American Engineers and Scientist (MAES) student chapter. He won a two-year transfer student scholarship from the UC-Edison Scholars Program, a total of \$15,000 support. Upon transferring to the University of California, San Diego as an upper division engineering major, he became involved in CAMP.

Bravo has been intensively involved in research. Through the American Society of Mechanical Engineers, he has worked on the Human Power Vehicle, for which he designed AutoCad drawings for the vehicle fairing, and conducted aerodynamics analysis on the small scale model of the fairing.

In the Mechanical and Aerospace Department, he designed and created a one-legged jumping robot by using AutoCad and a LaserCamm. For this, he worked with a Basic Stamp circuit, Accelerometer, and Parallax program for activation of the robot. He also created a prototype of the one-legged jumping robot with Working Model 2D program that outputs a prototype of the jumping robot in 2D to calculate the theoretical natural frequency.

Other research endeavors include designing and manufacturing a mechanical clock out of acrylic by using AutoCad and a LaserCamm, and a three wheel robot.

During Summer, he was a CAMP researcher at UC Irvine, where he assisted in the creation and analysis of a micro-electric power unit. He also designed, under a limited budget, three energy-producing solar-panel cells.



Bravo's vigorous leadership on campus includes Outreach Coordinator, Society of Hispanic Professional Engineers and the MESA Engineering Program.

In his undergraduate career, Bravo has attended numerous conferences, where he has presented his research in both poster and oral formats. In addition to local symposia on campus, such as the Faculty Mentor Program Research Symposium and the UCSD Summer Research Conference, he has presented at national venues, including SACNAS, of

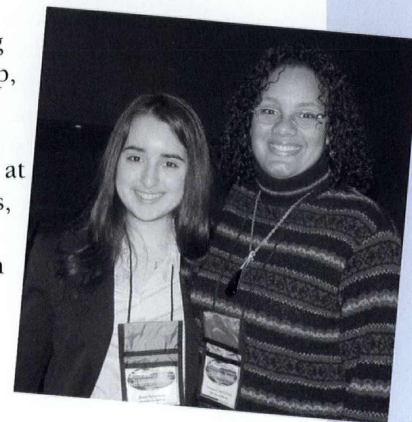
which he is a member. He is also a member of the American Society of Mechanical Engineers UCSD Chapter, and the American Public Works Association, Southern California Chapter.

YVETTE VALENZUELA

- Senior, Bioengineering
- B.S. Degree expected 2006
- Honors and Awards: Warren College, UCSD, Provost's Honors, multiple academic quarters; National Society of Collegiate Scholars, 2002 to present; UC Leadership Excellence through Advanced Degrees (UC LEADS), 2004-05; CAMP Statewide Undergraduate Scholarship

Yvette Valenzuela is an outstanding student and role model who takes advantage of every opportunity for advancement that comes her way. In addition to conducting undergraduate research and presenting at national conferences, she is a member of two professional societies and volunteers as a mentor at a local elementary school. Valenzuela is working with the Silva Research Group, Retinal Neural Engineering Laboratory, Jacobs Retina Center, UCSD. She presented at SACNAS, 2004, Austin, Texas, and at the 2005 CAMP Statewide Undergraduate Research Symposium.

Valenzuela says, "It is through CAMP that I have become motivated to pursue



a Ph.D.” She actively seeks development opportunities and sees the value in collaborating with students and programs that support her long term goals. She states, “I am glad that there exists a program like CAMP. It definitely centralizes all the opportunities available to minority students. I have learned so much regarding ways to increase my opportunities for attending graduate school.” Valenzuela has taken advantage of some of the CAMP events such as the Diversity Forum for Graduate Study, Coffee with Faculty, and the off-campus site visit to Pfizer.

In her outreach mentoring and tutoring, she visits Logan Elementary School, where she helps students develop an interest in science. She says, “I find this important not only for me, but in general because it is necessary that these children gain proficiency in math and science—which, unfortunately, the public school system has not been able to fully succeed.”

UC SANTA BARBARA/ UC SANTA CRUZ

JAVIER SANTILLAN, Ph.D.

- **Future University Professor**
- **Postdoctoral Fellow, Geophysics, Massachusetts Institute of Technology (MIT)**
- **Ph.D. Earth Sciences: Geophysics, UC Santa Cruz, 2004**
- **B.S. Geological Sciences, UC Santa Barbara, 1999**

Dr. Javier Santillan is one of the stellar student success stories from the Santa Barbara campus. His achievement of the doctoral degree is a source of pride to both University of California campuses of which he is an alumnus, especially to the former CAMP Faculty Director, Professor Kenneth Millett, to whom Santillan recently corresponded. Santillan says in an email to Professor Millett, “I am still happy to check in with you and keep you updated on your CAMP alumni.”

Currently, Santillan has a postdoctoral fellowship in Geophysics at MIT, investigating the effect that different crystal chemistries have on the structure of deep Earth silicate materials at the interface between the Earth’s core and the mantle. He also measures the effect that static high-pressures have on metal oxides.

As an undergraduate, Santillan served as a teaching assistant for several geological sciences courses:

Geology of Yosemite Valley, Field Methods, and Earth Materials III (Sedimentary and Metamorphic Petrology).

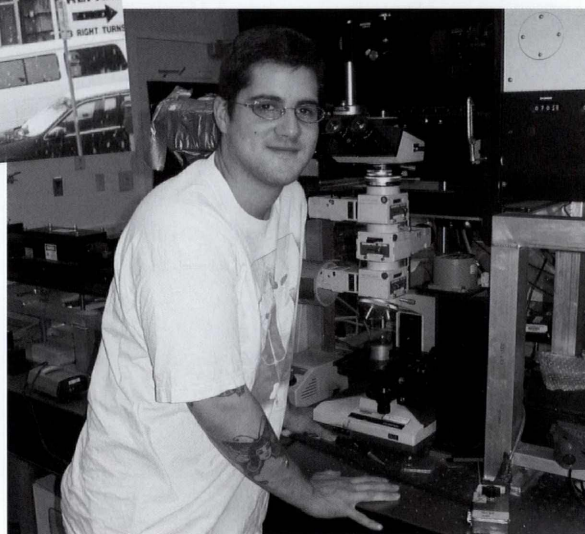
Of his undergraduate experience, he says, “I was a MAP Peer Facilitator from 1995 to 1998 and then I undertook a CAMP undergraduate research project in Geology at UCSB. MAP and CAMP enriched my UCSB experience in countless ways.”

Santillan went on to UC Santa Cruz for graduate school and completed the Ph.D. in Geophysics in June 2004.

Graduate student awards include the President’s Dissertation-Year Fellowship, (2003-04); the Graduate Assistance in Areas of National Need Fellowship (2001-02); and the Eugene Cota-Robles Fellowship, all at UC Santa Cruz.

Santillan is a member of the American Geophysical Union and is a reviewer for *American Mineralogist*.

He writes, “I feel my work with CAMP was instrumental in shaping my approach toward teaching a diverse group of students.” The value of participating in professional scientific organizations cannot be understated. Santillan says, “Towards the end of my graduate school career, I became involved with SACNAS (the Society for the Advancement of Chicanos and Native Americans in Science). My current goal is to secure a tenure track appointment.” He has submitted applications to Princeton, Case Western Reserve, Georgia Tech and the University of Florida.



Acknowledgements

Thanks and appreciation to all the student presenters who worked so hard to share their research in the poster and oral sessions. Of greatest importance, and without whom the CAMP program could not succeed, are the faculty mentors who take upon themselves the training of the next generation of scientists and engineers. Appreciation is extended to the National Science Foundation, Louis Stokes Alliances for Minority Participation for continued support.

Special Guest Speakers:

Dr. Ralph J. Cicerone, Chancellor,
University of California, Irvine,
CAMP Statewide Principal
Investigator
Dr. Martha Mecartney, Professor
of Chemical Engineering &
Materials Science
Luis Rodriguez, Bridge to the
Doctorate Fellow, UC Irvine
Jaquan Horton, UC Irvine, Bridge
to the Doctorate Fellow

Invited Guests:

Dr. Juan Arratia, Universidad
Metropolitana, Puerto Rico
Barbara Ige, Ph.D., Director,
STEM Diversity Programs,
UCLA Graduate Division
Lisa Bacon and Lauren Bacon,
COSMOS (California
State Summer School for
Mathematics & Science)
Alumni, UC Irvine summer
2004 program, and future
science majors

UC Irvine Undergraduate Student Host Committee:

Vilma Palma, Gloria Figuerora,
Monica Garcia, Angelica
Gutierrez
Melina Duarte, Committee Chair

Special Thanks to CAMP Coordinators:

Jacqueline Azize-Brewer,
Arja McCray, Renee Maldonado,
Laina Long, Bob Cota,
Kika Friend, Marlene Robinson,
Teresa Cofield

Special Appreciation:

Bridge to the Doctorate Fellows,
UCI and UCLA cohorts, For
participating in the Graduate
School panels
Mike Jenkins, For Providing
Technical Support to our Oral
Presenters and Judges
Melina Duarte, For Supporting
the Symposium with Creativity
and Enthusiasm, Producing
the Student Certificates,
Logo Items, Registration
Management and Student Host
Committee
Joan Deniken, For Supporting
Logistics, Hotel & Travel
Arrangements, and Purchases
Vilma Palma, For Formatting
the Abstracts, Nametags,
and General Assistance with
Registration

In Appreciation of Our Judges:

Derek Dunn-Rankin and Gary
Ford, Co-Leaders
Kenneth Millett, Poster Sessions
Presider, Both Categories

Biological/Life Sciences

Peter Velazquez, Oral Sessions
Presider
Enrique Cometto-Muniz,
Research Scientist, UC San
Diego
Gina Holland, Director, Biology
Undergraduate Scholars
Program, UC Davis
Paul Larsen, Assistant Professor,
Biochemistry, UC Riverside
Elizabeth Yoder, Assistant
Research Scientist, Radiology,
UC San Diego
Richard Weiss, Professor of
Biochemistry, UC Los Angeles

Physical Sciences/ Engineering

Glenn Beltz, Associate Professor,
Mechanical & Environmental
Engineering, UC Santa Barbara
Gary Ford, Associate Dean;
Professor, Electrical &
Computer Engineering, UC
Davis
Michael Marsella, Professor of
Chemistry, UC Riverside
Martha Mecartney, Professor,
Chemical Engineering and
Materials Science, UC Irvine
Amelia Regan, Assistant
Professor, Computer Science
Systems
Philippe Relouzat, Math
Instructor Coord., Learning &
Academic Resources, UC Irvine
Robert Rinker, Professor
Emeritus, Engineering, UC
Santa Barbara
Neal Schiller, Professor,
Biomedical Sciences, UC
Riverside/UCLA
James Shackelford, Professor,
Chemical Engineering and
Materials Sciences, UC Davis



SAVE THE DATE

Next Symposium
Feb. 24 - 26, 2006
Beckman Center

“The CAMP Symposium was an enriching experience because I had the opportunity to interact with undergraduate researchers from other UC’s. The small size of the conference created a more intimate environment conducive for networking. I was very impressed by the quality of research that was presented at this conference and was honored to be among the presenters. The Beckman Center was the perfect venue for a small research conference and it was very beautiful. I had a wonderful time.”

—Tyheshia Smith-Kruck,
Special Merit in Research Awardee,
Biological Sciences,
University of California, San Diego