

# CAMP

Louis Stokes California Alliance for Minority Participation

SYMPOSIUM IV

## PROCEEDINGS



University of California, Riverside • 2002

Davis • Irvine • San Diego • Santa Barbara • Riverside • Los Angeles • Santa Cruz • Berkeley

# CAMP

**CALIFORNIA ALLIANCE FOR MINORITY PARTICIPATION  
IN SCIENCE, ENGINEERING AND MATHEMATICS  
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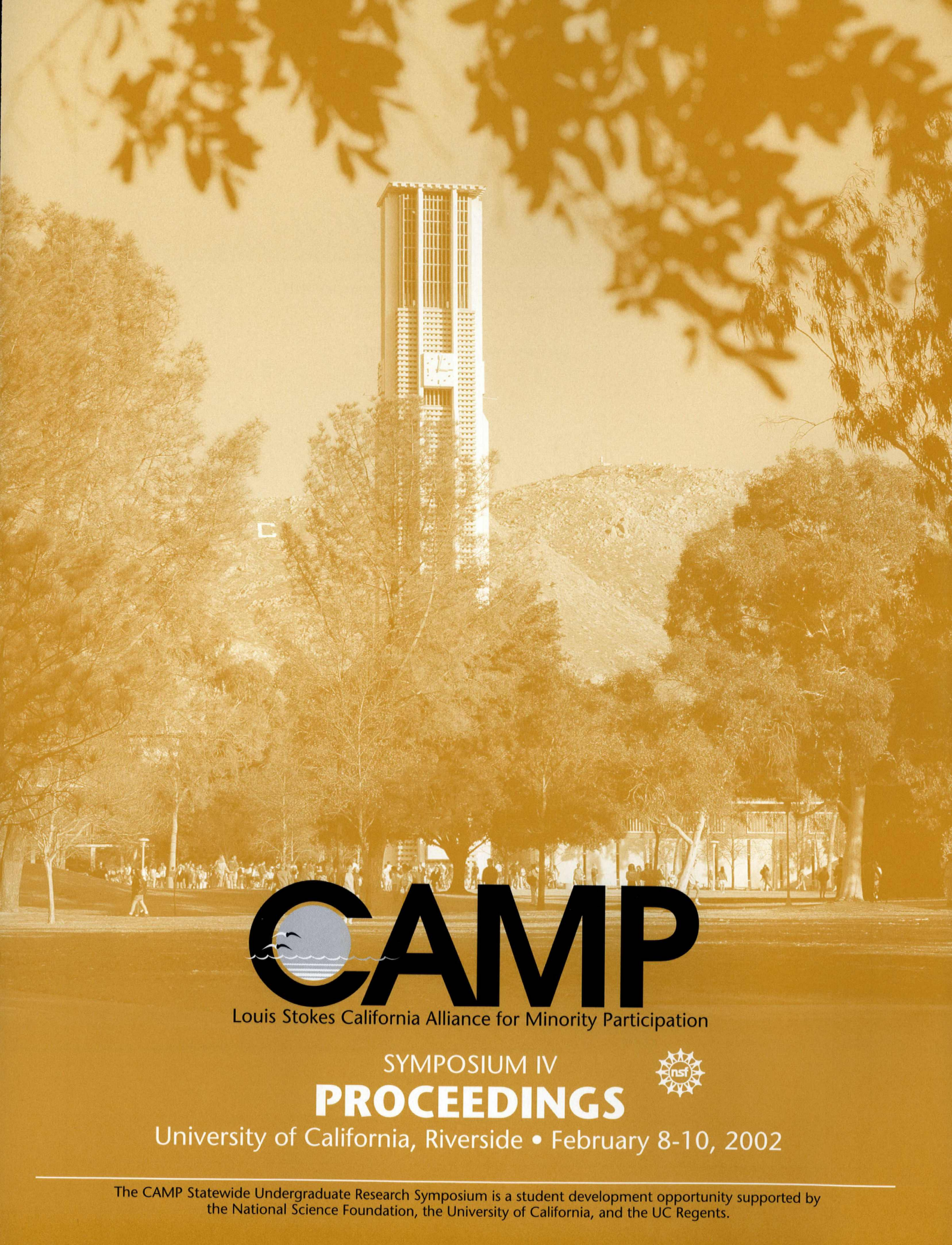
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wide Office in conjunction with the  
CAMP Quarterly.



# CAMP

Louis Stokes California Alliance for Minority Participation

SYMPOSIUM IV

**PROCEEDINGS**



University of California, Riverside • February 8-10, 2002

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

# *Congratulations*

CAMP Undergraduate Research Symposium

Presenters and Participants

# *Best Wishes*

For every success

in all your educational goals and  
research pursuits at UC and beyond.

May you achieve all your

career aspirations.

James W. Sandoval, Vice Chancellor  
UC RIVERSIDE  
HOST CAMPUS

CAMP Statewide  
Undergraduate Research Symposium  
February 2002



CAMP Statewide Office

Spring 2002

To The University Community,

We are pleased to present the proceedings of *Symposium IV*, the annual CAMP statewide undergraduate research symposium. The event was a collaborative effort that brought more than 100 students, faculty, program staff and supporters to the University of California, Riverside for a showcase of student research. Congratulations to all the undergraduates who by their commitment to pursue research exhibit uncommon resolve, dedication—and daring—qualities that distinguish them on their respective campuses and in the professional arena.

The opportunity to present builds credentials for the future, whether graduate or professional school or science and engineering-based careers. Support from the UC Regents and the National Science Foundation's Louis Stokes Alliances for Minority Participation as well as the campuses made this experience possible.

On behalf of our partners, we thank our host UC Riverside – with leadership from Professor John de Pillis, CAMP director, and Program Coordinator Teresa Cofield – for bringing us together from across California. These proceedings are also testimony to the UC faculty serving as mentors and the program staff that assist in a myriad of ways to prepare students for this important step. It takes courage, students, to face your peers in a formal setting and present the project to which you have devoted countless hours. Along with your mentors, we add: Well done!

*Juan Francisco Lara*  
Juan Francisco Lara, Ph.D.  
Assistant Vice Chancellor  
Statewide Executive Director

*Marjorie DeMartino*  
Marjorie DeMartino, M.F.A.  
Statewide Associate  
Executive Director

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## Dedication

CAMP Statewide Undergraduate Research Symposium IV  
is dedicated to

**James Del Castillo**  
(1966-2002)


for  
his legacy as a role model  
his devotion to mentoring undergraduates  
his contributions to CAMP-UCI and the Summer Science Academy

James leaves an academic and personal achievement record that will continue to inspire  
including the following selected accomplishments:

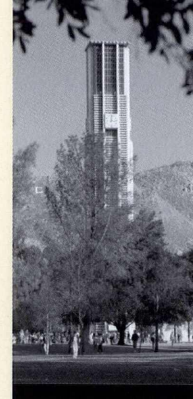
2000 Master of Theological Studies, Jesuit School of Theology, Berkeley  
1997 Ph.D., Mathematics, University of California, Irvine  
1990 B.S. Mathematics, California State Polytechnic University, Pomona

Connelly Award for outstanding teaching assistant among graduating  
doctoral students in the department of Mathematics, UC Irvine 1997  
President's Dissertation Fellowship (September 1996-June 1997)

CAMP Summer Program Instructor (1992-1997), (1999-2000)  
Mentor (Summer 1998) Mathematical Science Research Institute at Berkeley  
Teaching Assistant (1992-1996) Department of Mathematics, UC Irvine

——  
“Thank you, James, for your important contributions  
to mathematics, teaching and humanity.”

—Professor Bernard Russo,  
Department of Mathematics, UC Irvine

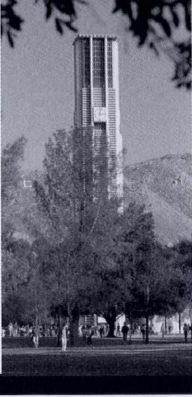


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## CAMP DEFINED

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

# "CAMP"

## MISSION

CAMP goals support the National Science Foundation's Louis Stokes Alliances for Minority Participation, named in honor of Congressman Louis Stokes. CAMP is dedicated to UC undergraduate achievement and B.S. degree completion in science, mathematics, engineering and technology. Mentoring of undergraduates by university faculty and researchers, particularly in the laboratory, is the cornerstone of the program. Our faculty mentors believe that creative research is one of the best ways to prepare students for persistence and success in graduate work. These efforts affirm that scientists and engineers are best developed by other scientists serving as mentors who exhibit and expect scholarly excellence.

## EXECUTIVE SUMMARY

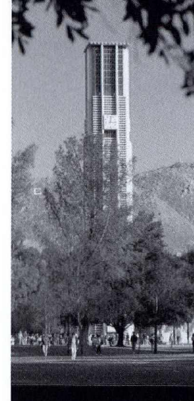
One of 28 national alliances, CAMP completed ten years (1991-2001) of a cooperative agreement between the National Science Foundation and UC Irvine, administrative center, and has received NSF funding for "Phase III" a new five year cycle, 2001-06. The primary goal is to significantly increase the number of B.S. degrees granted to underrepresented students in SMET (science, mathematics, engineering, technology) 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 professional workplace. The program serves undergraduates through enrichment opportunities and faculty mentored research supported by stipends. 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 10,092 B.S. degrees awarded to underrepresented minorities by UC since 1990. Activities center on faculty mentored research experiences, collaborative learning, presenting at scientific conferences, science writing and co-authorship, technology proficiency, and preparation for graduate school. Student achievement is disseminated through the *Quarterly* and on-line, [www.camp.uci.edu](http://www.camp.uci.edu). The UC Regents Diversity Initiative supports program administration.

## THE UNDERGRADUATE RESEARCH SYMPOSIUM GOALS

# Goals

*Support and encourage* 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.; and  
*Set national standards* for undergraduate research.





## SYMPOSIUM SUMMARY

The University of California, Riverside hosted the fourth annual CAMP Statewide Undergraduate Research Symposium February 8-10, 2002. CAMP Regional Director John de Pillis, Professor Emeritus of Mathematics, and co-coordinators Teresa Cofield and Isabel Zamudio, welcomed more than 100 University faculty, students and program staff to the campus. Fifty-two presenters represented the partner UC campuses. Student presentations were grouped into two main categories, Life Sciences and Physical Sciences/Engineering. At the opening night dinner, Vice Chancellor James W. Sandoval welcomed students and urged them to take their knowledge and apply it for the betterment of others. He challenged students to think in terms of giving back to the whole of society, not just the communities from which they come. Sandoval shared his personal experiences with students and the increasing importance of science and mathematics proficiency in today's world. Also welcoming students was Roger Hayes, Assistant Director of the UCR Learning Center, which houses CAMP. Oral and poster presentations were scheduled Saturday, February 9. The Student Recognition Luncheon broke new ground for the symposium format, with awards presented to the top undergraduate mentor from each UC campus, and awards for the top selected graduate student mentor, postdoctoral fellow mentor, and the transfer students who received UC-Edison scholarships. Also honored was Sarah Richards Axford, UC San Diego coordinator who has stepped down from her position to care for her first child, Noah. Sarah invigorated the program at San Diego with an array of student services including GRE preparation and research mentoring, as well as establishing the CAMP newsletter at UCSD. The symposium culminated with the awards dinner at "The Barn," with special achievement plaques presented to fourteen students. John de Pillis invited keynote speaker Robert

Haddon, Distinguished Professor of Engineering, and Gary Scott, Associate Dean and Professor of Chemistry to the dais to extend congratulations on behalf of the faculty. UCR graduating senior Boaz Cotton, a previous research award recipient, presented the Peer Review awards for best overall poster and best overall oral presentation. All presenters were eligible to nominate their top candidates. Daniel Smith, a graduate student at UCR and long-time CAMP participant and celebrated researcher, assisted with the Peer Review selections. On the lighter side, Dr. Juan Arratia of Universidad Metropolitana, San Juan, Puerto Rico, was recognized as the 'farthest traveled' faculty mentor. Dr. Arratia brought two undergraduates who presented. The weekend also convened CAMP program leadership from the eight general UC campuses, with 22 faculty and staff engaged in discussions related to Phase III. The agenda centered on areas of focus for the next five years to reaffirm collaborative efforts on goals shared with the National Science Foundation and the affiliated Louis Stokes Alliances for Minority Participation.

# Symposium Schedule

### **FRIDAY, FEB. 8, 2002 — ARRIVAL AT THE SHERATON ONTARIO AIRPORT HOTEL**

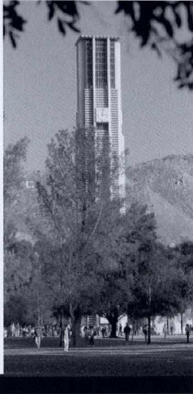
3:00 - 6:00 pm	Registration in the lobby area
6:00 - 8:30 pm	Welcome Reception and Dinner, Orchid Room

### **SATURDAY, FEB. 9, 2002 — ALL EVENTS AT UC RIVERSIDE**

7:30 - 8:00 am	Charter buses begin departing to UC Riverside
8:00 - 9:00 am	Continental Breakfast, University Commons Judges Meeting, International Lounge Poster/Oral Presentation set up, Commons Terrace Rooms
9:00 - Noon	Research Presentations
Noon - 2:00 pm	Student Recognition Lunch, Commons
2:00 - 5:00 pm	Research Presentations
6:00 - 8:30 pm	Awards Dinner, The Barn (near carillon bell tower mall)
8:30 - 9:00 pm	Buses depart for the Sheraton

### **SUNDAY, FEB. 10, 2002 — CLOSING DAY**

8:00 - 11:00 am	Breakfast Buffet, Grapevine Room at the Sheraton
9:00 - 11:00 am	Directors/Coordinators Breakfast, Magnolia Room
12:00 Noon	Check out of rooms



## NEW ASSISTANT DIRECTOR

### Up Close and Personal: INTRODUCING SANTANA RUIZ ASSISTANT DIRECTOR CAMP STATEWIDE

# Profile

#### **Appointment to Assistant Director**

- Appointed December 1, 2001
- First official CAMP duty—visit the CAMP faculty director and coordinator on each UC partner campus by February 1, 2002

#### **Current Position**

- UCI Center for Educational Partnerships, Director of Community College and Community Programs; Assistant Director, CAMP Statewide

#### **Education**

- B.A Political Science, UC Irvine, 1992; Master of Education with concentration in administration, planning and social policy, Harvard University, 1997



Santana Ruiz

#### **Hometown**

- OASIS, California

#### **High School**

- Coachella Valley High School. “My favorite course was World History taught by my favorite teacher Mr. Rich Alavarez who is now the Assistant Superintendent at Coachella Valley Unified School District.”

#### **Undergraduate Faculty Mentor**

- Professor Caesar Sereseres, Department of Political Science, UCI. “I admire his political savy and his tremendous support to prepare underrepresented students for graduate school. He does an excellent job of challenging your intellectual capability without discouraging you.”

#### **Special Interests**

- Teaching at the community college and collaborations to increase the transfer rates to UC; and now, through CAMP, increasing the rate for science and math transfers.

#### **Importance of Mentoring**

- “The most important aspect of any mentoring activity is follow up and consistency. As a former mentee and as a current Puente Mentor I value the relationships that develop into mutual trust and support.”

#### **Professional Activities**

- Coordinator for the Orange County Transfer Consortium, a regional collaboration between the nine Orange County community colleges and UCI focused on increasing transfer rates to the UC system.
- Lectures in UCI course, Educational Policy Field Study. “The goal is to merge educational policy theory and practice.”
- Teaches basic computer course for Rancho Santiago Community College District.
- Community Bridge consultant with the Los Angeles Educational Partnerships
- Serves on the Western Association of Schools and Colleges (WASC) accreditation committee, since 1998.
- Directs the Hispanic Education Endowment Fund’s Leadership Institute for high school juniors, a summer residential program at UCI.
- Previously served as special projects coordinator for the Southwest Voter Research Institute.
- Directed the CAMP Summer Science Academy for two years in Phase I.

#### **Favorite Read**

- “My all-time favorite book has to be ‘Master of the Game’ by Sidney Sheldon. It is the only book I have read more than once (three times).”

#### **Favorite Pasttimes**

- “I love sports and politics. I’m an avid Oakland Raider, Los Angeles Lakers, LA Dodgers, and ESPN fan. I also love reading anything on current politics and enjoy watching Nightline, Cross-Fire and anything on CNN.”

#### **Who Inspires You Most?**

- “Obviously my parents for their hard work and unwavering support towards my education. I also get inspired by anyone who can talk about a current social or political issue and can relate it to a historical fact or strong supporting data. Public speakers that can easily quote historical facts relevant to their topic always grab my attention.”

**ROBERT CORT HADDON, DISTINGUISHED PROFESSOR**  
*Chemical and Environmental Engineering, UC Riverside*

Professor Robert Haddon joined UC Riverside in 2000. He is the College of Engineering's first "Distinguished Professor." Haddon grew up in Longford, Tasmania. He obtained the B.Sc. degree at Melbourne University in 1966, and shortly thereafter accompanied L.M. Jackman to the Pennsylvania State University where he completed a Ph.D. in organic chemistry in 1971. He was a postdoctoral fellow at the University of Texas, after which he accepted a Queen Elizabeth II Fellowship at the Australian National University. From 1978-1990, Haddon was a member of the Chemical Physics Research Department, before assuming a position in the Materials Chemistry Research Department at AT&T Bell Laboratories. In 1997 he was appointed Professor of Chemistry and Physics at the University of Kentucky, and in 1998 he became Director of the Advanced Carbon Materials Center. Haddon co-founded Carbo-Lex, Inc., a company that produces single-walled carbon nanotubes; in 1999 he founded Carbon Solutions, Inc. Dr. Haddon's research interests address the electronic structure and properties of molecules and materials, including the discovery of new classes of electronic materials. Over the past ten years has turned his attention to the understanding of nonplanar conjugated organic molecules. His research group studies radical conductors and carbon nanotubes. They prepared the first soluble single-walled carbon nanotubes (SWNTs), allowing the study of naked carbon metals and semiconductors in solution.



*Robert Cort Haddon*

**JAMES W. SANDOVAL**

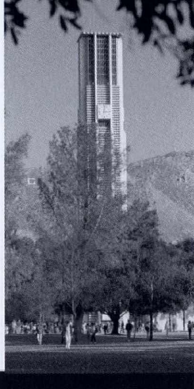
*Vice Chancellor, Student Services, UC Riverside*

James W. Sandoval, appointed Vice Chancellor for Student Services July 1, 2001, oversees a variety of student programs, including outreach and retention, financial aid, course registration, student clubs and organizations, campus health and counseling services career development programs. Sandoval is a strong advocate for students and for the many services that support student well being. He has a deep understanding of the technical areas in student services and enrollment that make significant differences in our students' successes. He is involved in every aspect of outreach efforts that have resulted in a diverse student body of the highest quality. He sees great opportunity in the growth UCR is experiencing to build for the future and to maintain UCR's very special qualities. Sandoval, who joined UCR in 1989 as financial aid director, most recently served as associate vice chancellor and registrar. In that capacity, he administered student outreach programs that saw UCR enrollment increase by 46 percent since 1995. He also managed financial aid and course registration functions, including the implementation of UCR's online system for class registration, billing information and degree checks. Sandoval earned his master's degree in public administration at California State University, Fullerton in 1987 and his bachelor's degree in political science at the University of San Diego in 1982. Prior to joining UCR, he was assistant director of financial aid at UC Irvine.



*James W. Sandoval*

**KEYNOTE  
SPEAKERS**



## SPECIAL RECOGNITION

Symposium IV presented an opportunity to recognize students and staff who have made extraordinary contributions to CAMP through mentoring or program leadership. A set of mentoring awards recognized undergraduate mentors at the eight general UC campuses as well as a top graduate student and postdoctoral fellow who made important commitments to undergraduate development. Additionally, the CAMP program coordinator who brought tremendous advancements to the program at UC San Diego, Sarah Richards Axford, was honored. Sarah recently left her position to take care of her newborn son full time. Besides creating a model graduate prep component with GRE practice exams, she tutored in chemistry, designed and delivered a CAMP newsletter, and organized and hosted the second annual CAMP statewide symposium at UCSD.

Sarah Richards Axford, in her article, "Science as the fulcrum," described in her own words her role as the CAMP coordinator:

Composing my "personal perspective" on the CAMP Science Program is startlingly similar to the types of requests I make of students all year long—submissions for the newsletter or for documentation, speeches at the year-end banquet, panel contributions, the whole gamut. And like those same students, I procrastinated, delaying my essay until the moral equivalent of Thursday before finals weeks. I gave my time instead to "other priorities," those activities that will swallow the day.

And what were those priorities? They are the students who come by after an exam to swiftly (and masterfully) demonstrate the problems they aced on

the o-chem midterm.

They are the students who linger at the edges, responding to the occasional flyer with relief that some programming exists in study skills or career education. They

are the hungry ones who come to anything with pizza, snatching fortification for a long commute home. They are the voices at the other end of voice-mail and the hands at the other end of e-mail saying, "I was just wondering..." or "Is it possible..." They are the seniors with research experience under their belt and GREs in the 90th percentile who say "Is this good enough?" not yet certain of their own outstanding achievements.

Because of the point at which CAMP stands in the proverbial pipeline, only those students who were in some way pulled here, pushed here—or came to UC through sheer hard headedness—find their way to our offices. For that reason, our CAMP students are already students of intellect, commitment and ambition.

What then is the task placed before a program such as this? The brochure will tell you that the CAMP Science Program for Chemistry and Physics Majors provides tutoring, research opportunities, field trips and resources that range from computer access to library books to small book scholarships. What the brochure will not tell you about is one of the most valuable components of CAMP, something that students at every level can benefit from and can themselves create—a community of scientists in support of one another.



**SARAH RICHARDS AXFORD**  
CAMP Coordinator,  
UC San Diego, 1997-2001  
*Recognized for her leadership  
and dedication to undergraduate  
achievement.*

## New Awards

*The awards say Thank You to individuals making a difference, one student at a time.*

**JAMES DEL CASTILLO  
MEMORIAL AWARD  
FOR MENTORING**  
*Daniel J. Vera*

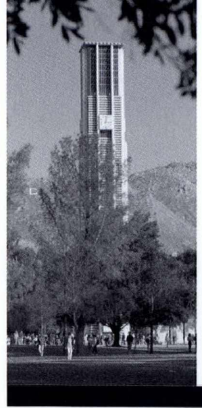
**GRADUATE MENTOR  
AWARD**  
*Ruben Alarcon*

**POSTDOCTORAL  
FELLOW MENTOR**  
*Eefei Chen, Ph.D.*

**PEER MENTOR AWARDS**  
*Norma Sosa – UCLA*  
*Pedro Olea – UCR*  
*Melanie Zauscher – UCSD*  
*Ann Orthuber – UCSC*  
*Yusef Collins – UCB*  
*Abimbola "Bim"*

*Majekodunmi – UCD*  
*Eduardo Ramirez - UCI*  
*Ricardo Gomez – UCSB*

**CAMP COORDINATOR  
AWARD**  
*Sarah Richards Axford*



**JAMES  
DEL CASTILLO  
MEMORIAL  
AWARD FOR  
MENTORING**

To honor the memory of Dr. James Del Castillo, to whom Symposium IV was dedicated, the Irvine CAMP program acknowledges a graduating senior who has served as an exemplary mentor/tutor for at least three consecutive quarters. Daniel J. Vera, who carries a gpa of 3.98, was selected to receive this honor. His hometown is Corona, CA, and he transferred from Orange Coast College in 2000—and quickly made a name for himself at UC Irvine. Mathematics Professor Bernard Russo says, “Daniel has a gift for mathematics. He absorbs abstract concepts with ease and thrives on them.” Vera has been admitted to MIT for graduate school.

**DANIEL J. VERA**

# Profile

**Major**

- Mathematics, University of California, Irvine; degree expected June 2002

**Honors**

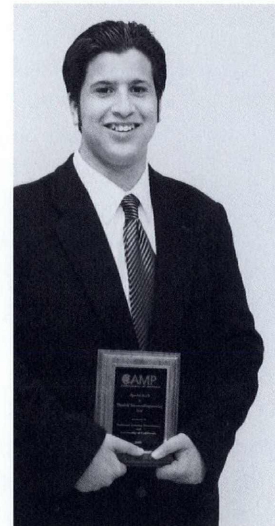
- McNair Scholar (Fall 2000-01)
- California Alliance For Minority Participation (CAMP) 2000 Summer Research Scholar
- Golden Key Honor Society Member (Elected Fall 2000)
- Dean's List, 2000 through 2002
- Golub Scholarship Recipient (2001-02)
- Harburger Scholarship Recipient (2001-02)
- University California Irvine Leaders Scholarship Recipient (2000-01)
- Elected to Alpha Gamma Sigma (2000)
- Orange Coast College Honors Program (1998-2000)

**Tutoring/Mentoring**

- CAMP-UCI Mathematics Tutor (2000 - present)
- Teacher's Assistant, UC Irvine CAMP Summer Program (2001)
- Grader at UC, Irvine, Mathematics Department (Spring 2001)
- Teacher's Assistant for Elementary Analysis (Math 140B), UC Irvine, Winter Quarter 2000-01
- Upper division Statistics and Probability, upper division Real Analysis and Topology, upper division Complex Analysis, Abstract Algebra I & II, upper and lower division Linear Algebra, lower division Calculus series, Ordinary Differential Equations, Intro to Abstract Math, PreCalculus, Beginning Statistics, Trigonometry

**Presentations**

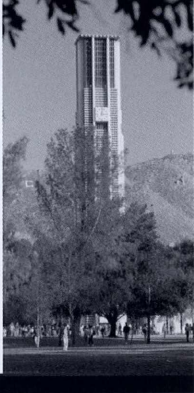
- CAMP Symposium IV – UC, Riverside, February 9, 2002 – “The Art of Mathematics” (Awardee, Oral Presenter)
- UCI Early Academic Outreach Program, 2001, Talk on String Theory
- CAMP Symposium III – UC Davis, April 7, 2001 – “The Art of Mathematics”
- CAMP Summer Scholar Research Symposium – UC Irvine, 2000 – “The Art of Mathematics”
- CAMP Open House Oral Presentation- UC Irvine, Spring 2000



*Daniel J. Vera*

*“Daniel Vera has become my academic hero. His success drives my success, and in our daily conversations, he tries his utmost to challenge me. Daniel is the mentor of mentors.”*

—Brandon Brown, junior, mathematics, UCI, 2001 CAMP-Toshiba Scholar



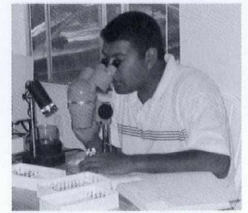
## GRADUATE MENTOR AWARD

Mentoring creates dynamic and empowering experiences for the participants. The Graduate Mentor Award recognizes a graduate student who seized the opportunity for leadership and demonstrated skill and creativity in providing a summer research program for undergraduates. The 2001 recipient is Ruben Alarcon, a doctoral student at UC Riverside who himself benefitted from mentoring relationships as an undergraduate at UC Irvine. He is listed as co-author on a paper submitted for publication: Reproductive isolation and hybrid pollen disadvantage in *Ipomopsis*. 2002.

### RUBEN ALARCON

#### Education

- Ph.D. Biology program, UC Riverside, with emphasis in ecology and evolution. Dissertation centers on conducting a community level pollination study in the San Bernardino Mountains to test ideas regarding the degree of specialization in plant-pollinator interactions.  
*Advisor: Dr. Nickolas M. Waser, AAAS Fellow*
- June, 1998 B.S. in Biology with a specialization in Ecology and B.S. in Chemistry, UC Irvine



#### Selected Research Experience

- Summer 1995- Minority International Research Training Program in Tropical Biology, Veracruz, Mexico. Participation included two weeks of intensive training in tropical ecology and five weeks of field experience. Independent project on species diversity and distribution across two types of forest/pasture edges.  
*Mentors: Dr. Rodolfo Dirzo, and Dr. Alan Thornhill*
- 1995-1998- Independent research on the population genetics and gene flow of *Dudleya multicaulis* on two spatial scales using gel electrophoresis.  
*Mentor: Dr. Harold Koopowitz*
- Summer 1996- Harvard's Organismic and Evolutionary Biology Summer Fellowship. Evolutionary study of the bark beetle family *Scolytidae*.
- Summer 1997- Rocky Mountain Biological Laboratory. Research Experience for Undergraduates. Pollen competition in an *Ipomopsis Aggregata* and *I. tenuituba* hybrid zone.

*"I have been involved in several programs aimed at increasing the retention of underrepresented students while preparing them for graduate school, such as the California Alliance for Minority Participation. I am willing and qualified to mentor those undergraduate students who may need role models sensitive to their cultural needs."* —Ruben Alarcon

#### Selected Presentations

- 1996- Campuswide Undergraduate Research Symposium. University of California, Irvine. Poster presentation. Species invasion across two types of tropical forest/pasture edges.
- 1996- Ronald E. McNair National Undergraduate Research Symposium. Penn State. Oral presentation. Species invasion across two types of tropical forest/pasture edges.
- 1996- Organismic and Evolutionary Biology Intern Poster Session. Harvard University. Phylogenetics and evolution of bark beetles.
- 1996- Ecological Society of America/Society for Conservation Biology Annual Conference.

*More Alarcon on page 34*

Dr. Eefei Chen is a postdoctoral research in the lab of UCSC Dean of Natural Sciences David Kliger. Over the past several years she has volunteered her time to provide CAMP students with workshops to build presentation skills that support and enhance their oral and poster presentations. Marlene Robinson, CAMP Coordinator, championed Dr. Chen's award. She said, "Eefei has been instrumental to our program and we are pleased to have her as part of our CAMP family." She served as a judge for Symposium IV.

## EFEI CHEN, PH.D.

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY, UC SANTA CRUZ

### Education

1986-93 Georgetown University, Dept of Chemistry, Washington, D.C., Ph.D. Biochemistry

1981-85 Brown University, Providence, Rhode Island, Sc.B. Chemistry

### Research Experience

1993-Present Postdoctoral Fellow with Dr. David Kliger, University of California, Santa Cruz using far and near uv time-resolved circular dichroism (TRCD) and absorption (TROD) techniques to study the dynamics of various proteins. Recently, there has been a focus on time-resolved optical rotatory dispersion (TRORD) spectroscopy.

Collaborative work with Dr. Pill-Soon Song, University of Nebraska (protein dynamics of phytochrome activation and inactivation in the far uv and far red spectral regions); Dr. Larry Parkhurst, University of Nebraska (TROD and TRCD ligand recombination studies of dimeric hemoglobin from the *thyonella gemmata* sea cucumber); Dr. Tack Kuntz, UC San Francisco (peptide folding dynamics); Dr. Tony Fink, UC Santa Cruz (refolding dynamics of carbonmonoxycytochrome c; Drs. Harry B. Gray and Pernilla Wittung-Stafshede, California Institute of Technology and Tulane University (refolding dynamics of reduced cytochrome c using an electron injection trigger); Dr. Andrew Woolley, University of Toronto (kinetics of  $\alpha$ -helix folding in an azobenzene peptide initiated by photocleavage); Dr. Peter Bayley, NIMR in London (laser temperature jump induced folding/unfolding of calmodulin); Drs. Thomas Gensch and Klaas Hellingwerf, Research Centre Jülich, Germany and Swammerdam Institute of Life Science, Amsterdam, respectively (dynamics of the photoactive yellow protein photocycle); Dr. Charlie Strauss, Los Alamos National Laboratory, New Mexico, developing the laser induced temperature jump method.

### Current Publications

"Laser Temperature Jump Protein Folding/Unfolding Monitored with Multichannel Nano-second Far UV ORD Spectroscopy" Eefei Chen, Youxian Wen, Charlie E.M. Strauss, James W. Lewis, Robert A. Goldbeck & David S. Kliger (2002) in preparation.

"Far UV Time-Resolved Optical Rotatory Dispersion Studies of the Denaturant Dependence of Secondary Structure Formation in Reduced Cytochrome c" Eefei Chen, Charlie E.M. Strauss & David S. Kliger (2002) manuscript in preparation.

"Dynamics of Partial Secondary Structure Unfolding in the Photocycle of Photoactive Yellow Protein Monitored by Time-Resolved Optical Rotatory Dispersion" Eefei Chen, Thomas Gensch, Andrew B. Gross, Johnny Hendriks, Klaas Hellingwerf and David S. Kliger (2002) submitted to *J. Amer. Chem. Soc.*

"Far UV Time-Resolved Circular Dichroism Detection of Electron-Transfer-Triggered Protein Folding" Eefei Chen, Pernilla Wittung-Stafshede & David S. Kliger (1999) *J. Am. Chem. Soc.* 121, 3811-3817.

### Honors and Awards

University of California President's Postdoctoral Fellowship 1993 and 1994

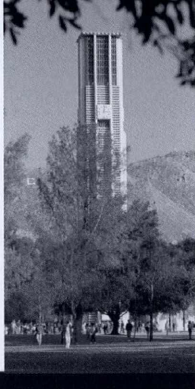
Grants-in Aid of Research from Sigma Xi, 1992

Achievement Rewards for College Scientists Scholarship (ARCS), 1990-1991

# Profile

POSTDOCTORAL  
FELLOW  
MENTOR





## UC-EDISON SCHOLARS

### 2001

Francisco Arceo, Irvine  
 Ruby Castellanos, Los Angeles  
 Christine Chavez, Riverside  
 Michelle Collins, San Diego  
 Keith Davis, Riverside  
 Esmeralda Espin, Riverside  
 Julio Espinosa, Irvine  
 Alicia Espitia, Los Angeles  
 Carlos Fuentes, Irvine  
 Soyini Hamit, Riverside  
 Nelson Herrera, Irvine  
 Fabian Hidalgo, Los Angeles  
 Michelle Islas, Irvine  
 Cuauhtemoc Magana, Berkeley  
 Charles Mendoza, Irvine  
 Irma Moreno, Irvine  
 Eric Morgan, Irvine  
 Claudia Pena, San Diego  
 Heidi Pidal, Riverside  
 Desiree Pinedo, Riverside  
 Rosemarie Ramirez, Davis  
 Carlos Ramos, Irvine  
 Lizzeth Romero, Los Angeles  
 Daniela Sandoval, Riverside  
 Shetema Stevens, Los Angeles  
 Zulma Vasquez, Riverside  
 Arturo Vieyra, Irvine  
 Marlyana Washington,  
 Los Angeles

### 2000

Paula Acuna, Berkeley  
 Antonio Bonet, Los Angeles  
 Letecia Cabanes, Los Angeles  
 Manuel Cortes, Irvine  
 Veronica De Leon, Davis  
 Rafael Gonzalez, Irvine  
 Orlando Hernandez, Irvine  
 Glenn Morataya, Irvine  
 Rurico Neri, Irvine  
 Steven Ortiz, Irvine  
 Christopher Wecklich,  
 Los Angeles

Applicants for the UC-Edison transfer scholarship must be enrolled in one of the 40 community colleges located within the Southern California Edison service area and on track to transfer to a UC campus with a declared major in science, engineering or mathematics. The scholarship of \$7,500 is renewable for two years, for a total of \$15,000. By the end of the five-year program, up to 100 students will have received support for the B.S. degree. The fundamental goal of the UC-Edison Scholars program is to increase transfer rates from California Community Colleges to the University of California and to stimulate future careers in science, engineering, mathematics and technology fields among students from educationally disadvantaged backgrounds. The scholarship is administered by the CAMP Statewide Office, and recipients are expected to participate in CAMP activities.

January 2, 2002

UC-Edison Scholarship Selection Committee  
 University of California, Irvine  
 CAMP Statewide  
 600 Administration Building  
 Irvine, CA 92697-1023



Dear UC-Edison Scholarship Selection Committee,

On behalf of my family and myself, I would like to thank you for awarding me with a \$15,000 scholarship to pursue my education. This scholarship means a great deal for us because with this generous donation, I will seriously be able to afford the expenses of attending UCLA. I am extremely grateful for your kindness and for believing in me. As a donor what you do is admirable and I want to thank you for putting your faith in me and recognizing that I have the potential to accomplish my goals and do something extraordinary with my life. My ultimate goal is to become a Pediatrician and with your help, I have confidence that I can achieve this aspiration. I've currently completed my first quarter here at UCLA and I am absolutely grateful for the opportunity to continue my education at this university with your help. Once again thank you so much for your dedication in helping students such as myself. My family and I are both greatly thankful, and with all honesty once I receive my Bachelor's degree in Biology, I will owe it to your organization for helping me these coming years earn my degree. Thank you!



Sincerely,

*Lizzeth Romero*  
 Lizzeth Romero



Two of the scholars presented their research at Symposium IV: Steven Ortiz and Zulma Vasquez. Their profiles on the following pages demonstrate the talent brought to UC from the community colleges. Their individual achievements contribute much to the greater good—and the future of California’s scientific professions. Lizzeth Romero, in her colorful letter on the facing page, expresses her appreciation—as well as her goals.

*Many of the UC-Edison Scholars joined the symposium. They are pictured here, flanked by Juan Lara, CAMP Executive Director (back row, far left); Santana Ruiz, CAMP Statewide Assistant Director (back row, far right); and Llyn Smith, who facilitated the scholarship application and award process for the 2001-02 Scholars (to left of Ruiz).*



**STEVEN G. ORTIZ**  
**UC-EDISON SCHOLAR, UC IRVINE**

**Major**

- Biological Sciences; B.S. degree anticipated June 2003
- Transferred from Fullerton College. A.S., Chemistry, 2000

**Research Experience**

- Cardiology research under Dr. John C. Longhurst, M.D., Ph.D., 2001 to present

**Volunteer Experience Related to Career Goals**

- SOS Clinic, Costa Mesa; UCI Family Health Clinic, Dr. F Jack Warner, Fullerton, Down Syndrome Clinic; LA County/USC Hospital, Internal Medicine Department; UCI Student Health Center; Queen of the Valley Hospital

**Awards and Honors**

**UC IRVINE**

- Dean’s Honor List, Winter 2001, Spring 2001
- McNair Scholar, 2001
- UC Irvine Alumni Scholarship, 2000 & 2001
- UC Irvine Biological Sciences Student of the Quarter, Fall 2001
- UC Irvine Town and Gown Scholarship, 2001
- UC Irvine Biological Sciences Tierney Scholarship, 2000

**FULLERTON COLLEGE (1999-2000)**

- Commencement Speaker, Fullerton College Graduation
- Lena and Fay Reynolds Scholarship
- All-California Academic Team, First Team Member

- Alpha Gamma Sigma Academic Achievement Award and Scholarship
- Alpha Gamma Sigma Club Service Award and Scholarship
- Alpha Gamma Sigma Community Service Award and Scholarship
- Community College League Scholarship
- Entomological Society of America Scholarship
- Frank Palko Humanitarian Award and Scholarship
- Fullerton Kiwanis Scholarship
- Joel Hail Memorial Scholarship
- Man of the Year
- Mu Omicron Delta Honor Society
- President’s Honor List
- Psi Beta National Honor Society

*“After completing my bachelors degree I intend to enroll in a Medical Scientist Training Program and attain an M.D./Ph.D. After graduation, I plan to have a dual career as both a physician and a biomedical researcher.” —Steven Ortiz*

*“All of these experiences have enriched me as a scientist because I have been involved with hands-on research using the scientific method. I also learned to work independently, under time constraints, and to overcome many challenges that are usually encountered in experiments conducted in the field and in the lab.”*

#### **Transferred from**

- Chaffey College, Rancho Cucamonga, CA

#### **Major:**

- Biology; B.S. degree anticipated 2003

#### **Educational and Career Goal**

- Graduate school; research as a career; serve as a role model for women and minorities in the sciences.

#### **Research Presentations**

- SACNAS (Society for Advancement of Chicanos and Native Americans in Science) 2001 National Conference, Arizona, poster presentation about the research conducted at Pomona College.
- CAMP (California Alliance for Minority Participation) Symposium IV, poster on research conducted at the Rocky Mountain Biological Laboratory, Colorado.

#### **Future Research**

- REU Program, El Verde Field Station in Puerto Rico, to broaden research skills such as statistical analyses that will be needed to succeed as a biology researcher

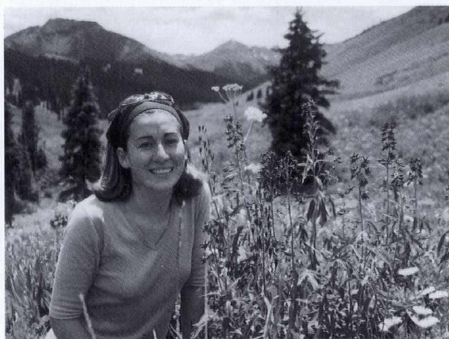
#### **Activities**

- Anatomy tutor, Life Science Department; biology, chemistry and math tutor, EOPS program; Traveling Zoo Program, teaching elementary and middle school students about biology; lab assistant, responsible for 30 aquaria containing live animals, and helped maintain laboratory's extensive collections.

#### **Research Experience**

- Research assistant under the supervision of a graduate student, studying the evolution of specialized floral phenotypes in a generalist pollination environment in a *Dudleya* species complex. Spring 2002 research investigates behavior of pollinators with respect to flower color in *Dudleya* and their interactions.
- Experience for Undergraduates (REU) Program at Pomona College, Claremont, California, and Rocky Mountain Biological Laboratory, Gothic, Colorado; Summer 2001 and 2002 Research
- Pomona College: studied the effects of habitat fragmentation in a native population of *Marah macrocarpus*. Field work involved collection of fruit and leaf tissues of various plants; laboratory work consisted of cellulose acetate electrophoresis for the samples collected in order to find out the genetic consequences of habitat fragmentation by deducing an inbreeding coefficient for the population.
- Rocky Mountain Biological Laboratory: focused on the effects of nest box temperature in nestling growth rate and parental feeding behavior in a montane

population of House Wrens. Conducted a field experiment that allowed handling of nestlings and observed the variation of parental behavior from nest to nest; measured food abundance.



*“Zulma is a rare gem. Given her talent and enthusiasm, I have sought to involve her in lab activities in any way possible. Zulma will contribute enormously in whatever endeavors she chooses to pursue... she is a great investment.”*

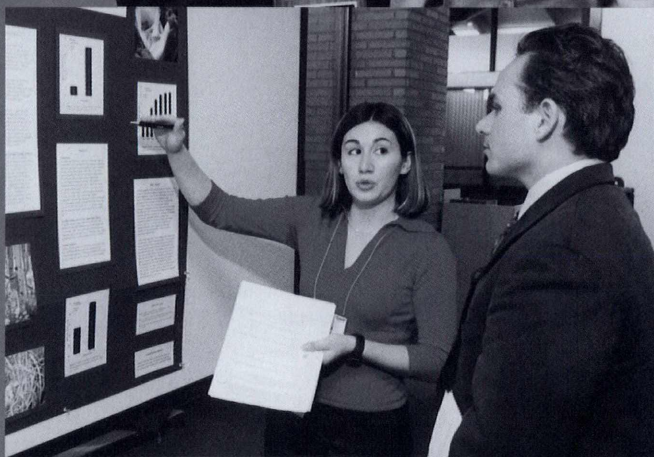
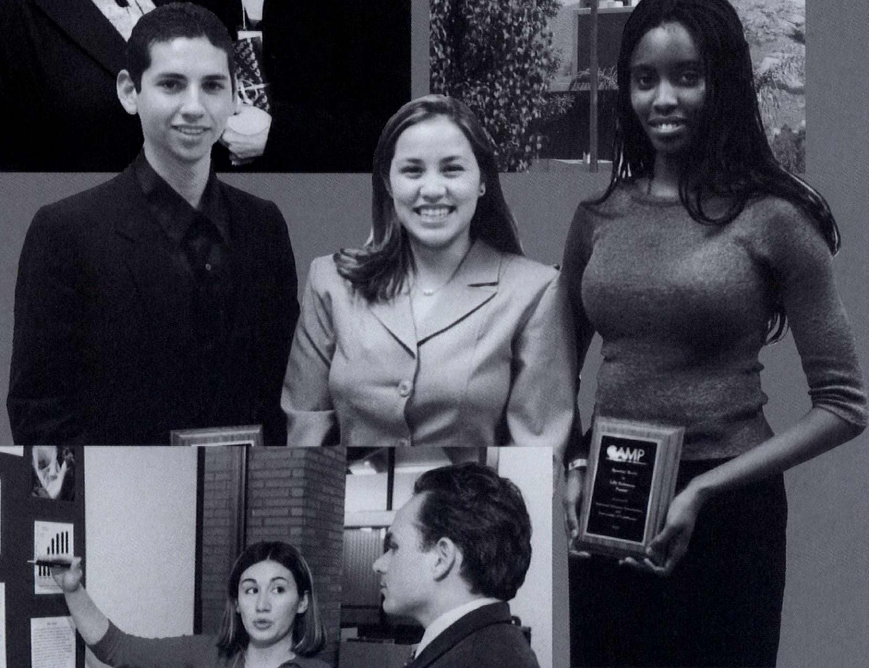
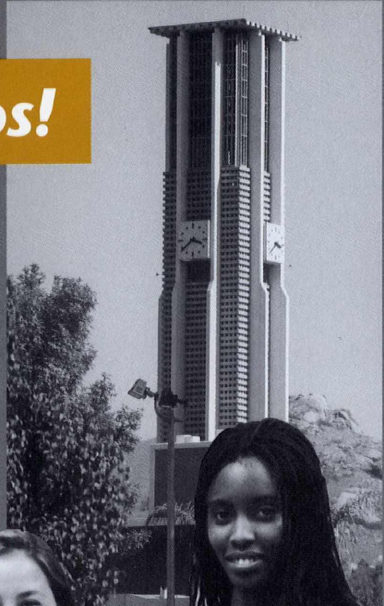
—Professor Robin Ikeda, Biology Department,  
Chaffey College (recommendation for UC-Edison Scholarship)

*“Zulma independently developed a new protocol for pollen exclusion that worked far better than what I had used the previous year... she has extraordinary potential as a scientist.”*

—Frances M. Hanzawa, Ph.D., Associate Professor and Chair of Biology, Pomona College, Claremont, CA



# We've Got Photos!



*"Give back to society—  
not just the community you  
come from, but society as a  
whole."*

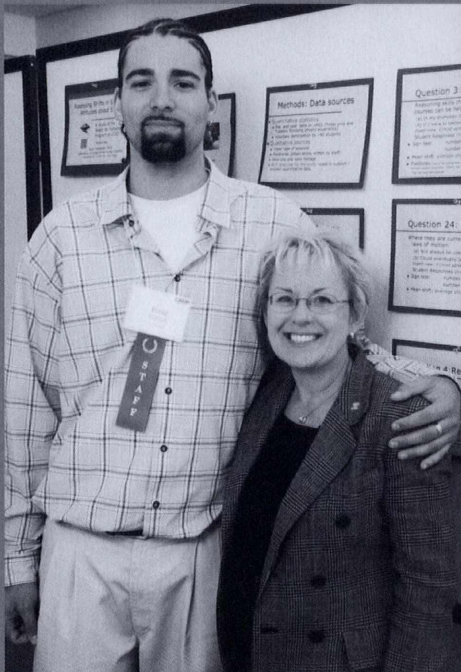
—Vice Chancellor  
James W. Sandoval





*"Today's symposium participants stand upon the shoulders of ten years of CAMP science, engineering and mathematics graduates in UC. Their acumen and intellectual promise is great. We have met the professoriate and the scientists of the future."*

—Juan Francisco Lara, Ph.D., Assistant Vice Chancellor and CAMP Statewide Executive Director

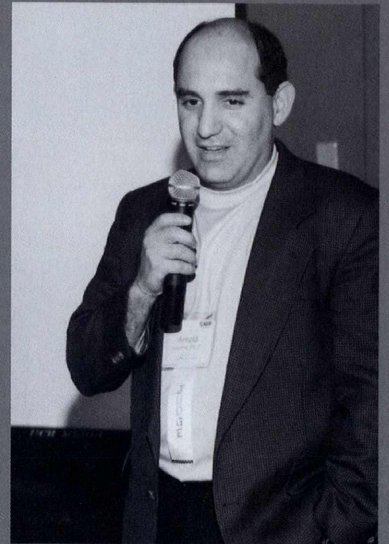
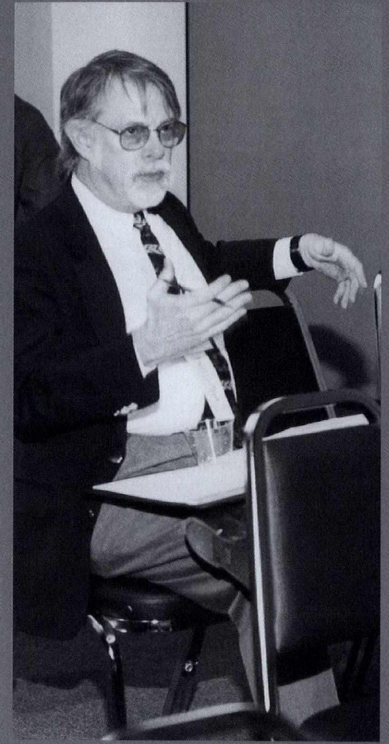


*Far left middle, the UC-Edison Scholars meet to discuss various aspects of their progress toward the B.S. degree. Above, Mr. Joe Vera, far left, congratulates his son Daniel Vera on his awards. They are joined by Dr. and Mrs. Philippe Relouzat. Left, UC-Edison Scholar Steven Ortiz enjoys discussion of his research. Ortiz's profile appears on page 15.*

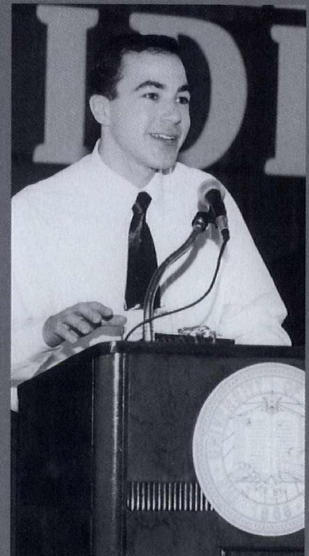
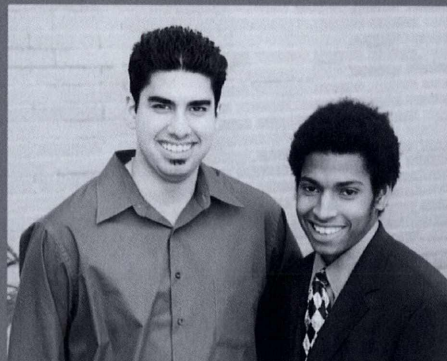
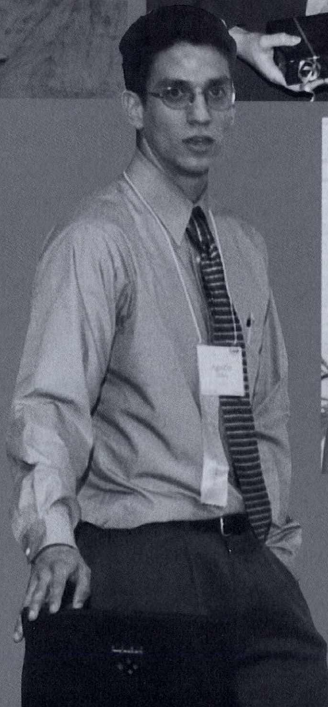
*"I was impressed by the breadth and depth of understanding of the research area by the CAMP students who presented their work. It was truly exciting to listen to the talks. The quality of the presentations was simply outstanding. I was particularly impressed by the students' response to the questions that were asked at the end of the talks. Thanks again for giving me the opportunity to participate. Symposia like these serve to remind us that the CAMP program is quite successful and necessary!"*

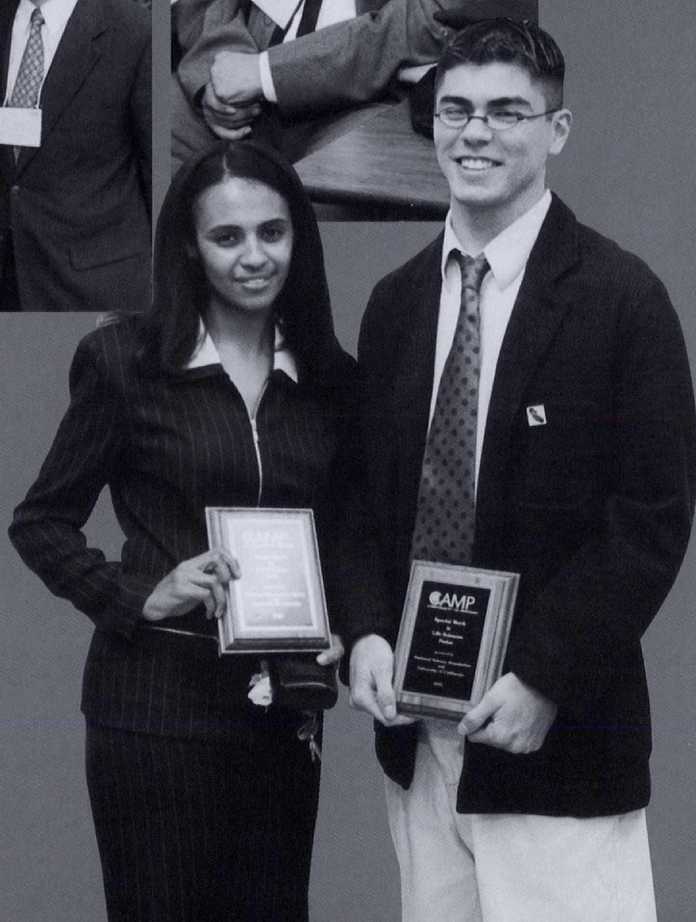
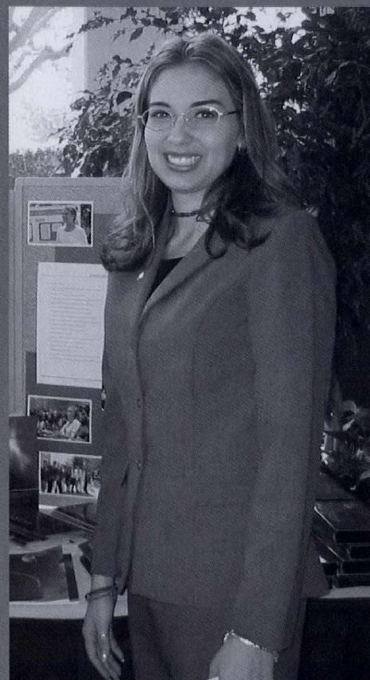
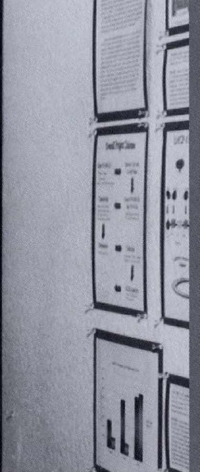
—Arnold Guerra III, Ph.D., Beckman Laser Institute & Medical Clinic, Laser Microbeam and Medical Program, UC Irvine

Below left, the UC-Edison Scholars met to discuss various aspects of their two-year scholarships, including the community service requirement. Several expressed interest in doing science and math outreach to K-12 students in UC partner schools.



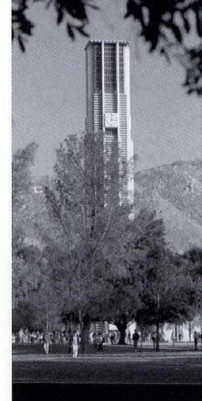
Center: Say it with flowers! Thanks and appreciation to CAMP Coordinator Teresa Cofield (right) and Assistant Coordinator Isabel Zamudio, our UCR hosts. Both are UCR alumni.





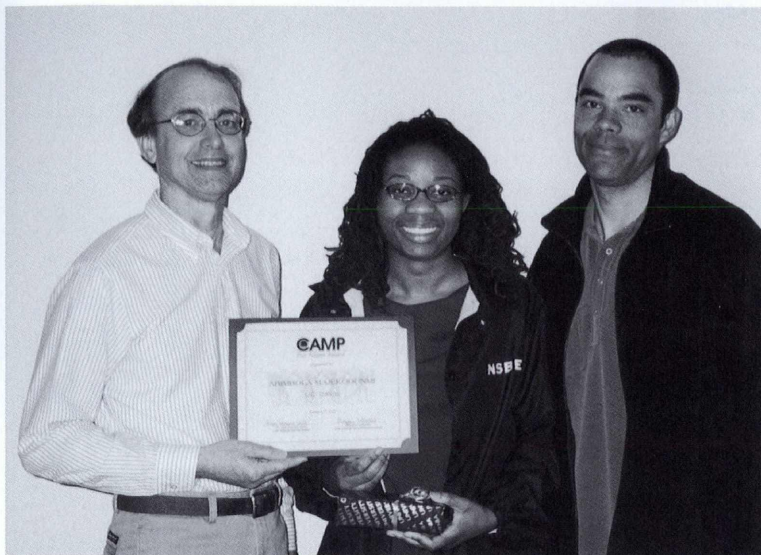
*Top left: Graduate student and four-year CAMP-er Daniel Smith gives serious thought to a poster presentation; middle left: Teresa Cofield thanks her CAMP student volunteers at the awards dinner; above, Dr. Juan Arratia, far right, with student presenters from his MIE project, San Juan, Puerto Rico; top right: Melina Duarte (UCI alumna, 2000) volunteered for the fourth consecutive year to assist with the symposium—she created all the special certificates and ensured timely delivery of all the engraved award plaques! Duarte serves as program coordinator for COSMOS, California State Summer School for Mathematics & Science at UC Irvine.*

The UC CAMP coordinators nominated exemplary students serving as peer mentors on their respective campuses. The award embodies the ideal of the CAMP project to promote mentoring as a valuable retention tool and an opportunity for personal and professional growth by both the mentor and his or her mentees. Students profiled in these proceedings represent the eight general UC campuses and serve as role models for all undergraduates who aspire to guide and support others on the path to their degree goals. The awardees were honored at the student recognition luncheon.



## PEER MENTOR AWARDS

*Savoring the moment: Abimbola "Bim" Majekodunmi enjoys her recognition as an outstanding peer mentor. Congratulations are offered by Dr. Gary Ford, Associate Dean of Engineering and UC Davis CAMP faculty director (left) and Dr. Ryan Mitchell, CAMP-UC Davis Coordinator.*



*"Often it's that one-on-one relationship that makes a difference. Mentoring is a vitally important and effective retention tool."*

—Derek Dunn-Rankin, Ph.D., Professor of Mechanical and Aerospace Engineering, UCI

### YUSEF COLLINS UC BERKELEY

#### **Major/Level**

- Chemical engineering, emphasis in biochemistry, senior

#### **Mentor**

- Dr. Edward Berry, Physical Biosciences

#### **Research Experience**

- Lawrence Berkeley National Laboratories, Structural Biology Dept., "Cell inner membrane protein purification and crystallization."

#### **Activities**

- Chemistry Scholars/Physics Scholars Program mentor (The Chemistry Scholars Program and Physics Scholars Program are supported by CAMP through The Berkeley Campus Coalition for Excellence and Diversity in Mathematics, Science and Engineering.)

### RICARDO GOMEZ UC SANTA BARBARA

#### **Major/Level**

Double major, Biochemistry and Chicano Studies, senior; anticipated date of degree completion, Spring 2003

#### **Educational/Career Goal**

MD/Ph.D.

#### **Faculty Mentor**

Prof. Mattanjah S. de Vries

#### **Research Experience**

UC LEADS Scholar, 2001-02  
Academic Research Consortium, Summer 2001

#### **Activities**

- Isla Vista Teen Center; Mathematics Achievement Program
- Educational Opportunity Program, Summer Transitional Enrichment Program (STEP)
- Mathematics Academic Peer Facilitator, Summer 2000
- Summer Institute in Mathematics & Science/Program of Determined
- Students (PODS) Peer Advisor, 2000-01
- Summer Institute in Mathematics and Science, Academic Residential Peer,
- Summer 2001 (CAMP sponsored)
- Mathematics Achievement Program, Academic Peer Facilitator, 2001-02
- Hermanos Unidos (Student Organization) Active Member, 1999-2001;
- Academic Chair, 2001; Historian, 2000-2001

#### **Awards/Honors**

- Chancellor's Scholarship (4 years)
- Regent's Partnership Opportunity Scholarship (4 years)
- Outstanding Freshman 1999-2000, Hermanos Unidos
- California Strawberry Scholarship (4 years)

**ABIMBOLA "BIM" MAJEKODUNMI  
UC DAVIS**

**Major**

- Electrical Engineering, minors in English and African American Studies

**Research Experience**

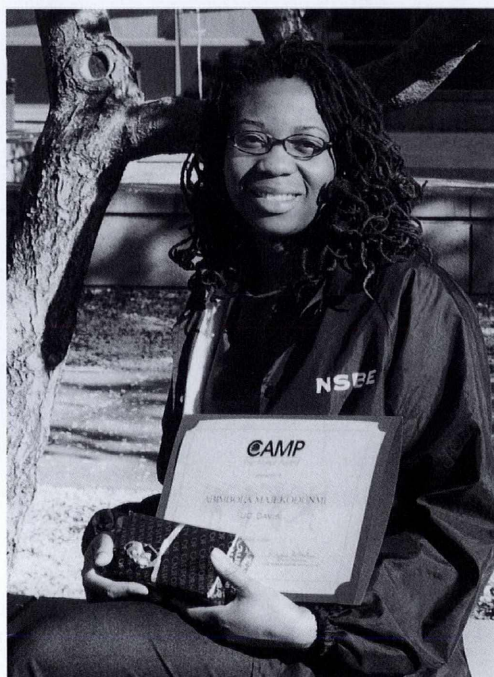
- At Georgia Institute of Technology, summer 2002, created a case study on pagers within the packaging research center
- Dual research assignments in UCD electrical and computer engineering department, developing analog filter using Lab VIEW for university instruction; assisting research and development of an online advanced placement high school course in human geography

**Awards**

- UC Davis Outstanding Senior, 2001
- National Collegiate Engineering Award, 2001
- National Society of Black Engineers, Region VI Academic Excellence Award, 2000
- McNair Scholar, 1999-2002
- UC Davis Minority Engineering Scholars Achievement Scholarship, 1998, 1999
- UC Davis Honors Challenge participant, 1996-1997

**Activities**

- Opening poet for Maya Angelou, 2001
- Member and officer executive board NSBE; math tutor; resident advisor; physics grader, UCD Summer Transitional Enrichment Program



*Abimbola "Bim" Majekodunmi*

*"Mentoring is to the future of any society like water is to life—this is why I do it."*

—Norma Sosa, UCLA

**PEDRO OLEA  
UC RIVERSIDE**

**Major/Level**

- Biology, graduating senior, 2002

**Goals**

- M.P.H., M.D.

**Experience**

- CAMP-UCR/Learning Center Peer Counselor, 2000-2002
- UC Riverside Entomology Department Lab Assistant, 1998-2001
- UCR-UCLA Biomedical Sciences/UCR University Honors Program Peer Mentor, 1998-2000
- CAMP-UCR Summer Enrichment Program in Mathematics and Chemistry Summer Counselor and Tutor, 2000, 2001

**Honors**

- Dean's Honors List, 7 quarters in 1997, 1998, 1999, 2000, 2001
- Chancellor's Honors List, 1997-1998 Academic Year
- Learning Center Outstanding CAMP Peer Counselor, 2001
- Chicano Education and Cultural Fund Scholarship, 1999

**Activities**

- Latinos in Science, 1997-2002:  
Science Awareness and Mentorship Program: promoting college awareness and the science field to elementary children through motivational speaking and experimentation.
- Students for Students: promoting college to middle and high school students through motivational speaking.
- African-Americans United in Science, 1999-2001
- Raza Assembly, UCR, 2000-2002
- Association of Para-professional Peer Counselors, 2000-2001

**Educational Programs**

- Minority Medical Education Program, Yale University School of Medicine, 1998
- UC Education Abroad Program, Fall 2001: Universidad Carlos III de Madrid, España

*"The peer mentors recognized here cast their splendor on the entire CAMP enterprise."*

—John de Pillis, UCR host director



**ANN M. ORTHUBER**  
**UC SANTA CRUZ**

**Major:**

- Physics; B.S. anticipated spring quarter 2002; B.A. Philosophy, 2001, UC Santa Cruz

**Mentor:**

- David E. Dorfan, Professor of Physics
- Yvonne Rodriguez, ACE Learning Skills Counselor

**Educational Goal:**

- Enroll in graduate school in UC and pursue research in robotics

**Research Experience:**

- Building and testing a six-legged walking robot equipped with a pyro-electric infrared sensor, fiber optic feelers, and a dual axis-accelerometer for the purpose of studying robot autonomy
- Astrophysics project using image processing and analyzing binary star data for the purpose of looking for changes in the periodicity of their eclipses

**Presentations:**

- SACNAS 2001 Annual Conference, "The Making of a Six-legged Autonomous Machine"
- UCSC Division of Natural Sciences and Baskin School of Engineering undergraduate research poster symposium, 2001

**Activities:**

- ACE section co-leader/mentor, tutoring and mentoring science students in lower-division physical courses, 2000-2002
- High school tutor in algebra, physics and robotics applications; robotics instructor at accelerated independent school

**Awards:**

- CAMP-NSF Summer Internship, 2001
- California Masonic Foundation Scholarship, 1996-2000
- American Physical Society Scholarship, 1996-98

*"Peer mentoring allows for a special interaction of knowledge; where thoughts about school and personal life are explored by both mentor and mentee."*

—Eduardo Ramirez, UC Irvine

**EDUARDO RAMIREZ**  
**UC IRVINE**

**Major/Level**

- Biological Sciences junior

**Current Faculty Mentor**

- Dr. Christine M. Gall; Dept. of Anatomy & Neurobiology

**Career Goal**

- Medical doctor

**Research Background**

- Dr. Stuart M. Krassner (Summer 2000, CAMP Summer scholars); Factors Inducing Metacyclogenesis in *T. Cruzi*
- Dr. T.Z. Baram (Summer 2001, UC LEADS): Prolonged Febrile Seizures Model: Consequences on Neuronal Injury in Limbic Structures & Neuropeptide Y Expression.
- Dr. Christine M. Gall (Fall 2001, UC LEADS/MBRS): Increases in Hippocampal Brain Derived Neurotrophic Factor mRNA by the Ampakine S36910-1.

**Awards**

- Chancellor's Leadership Scholar (1999)

**Activities**

- CAMP Mentor (2001-2002)
- Chicanos for Creative Medicine secretary (1999-2001)

**NORMA SOSA**  
**UC LOS ANGELES**

**Major/Level**

- Chemistry/Materials Science, graduating senior, 2002

**Mentor**

- Professor Bruce Dunn, UCLA Materials Science and Engineering Department

**Goals**

- Earn Ph.D. in Materials Science and Engineering; principal investigator and professor in materials science and engineering; will utilize advanced degree to help the educational progress of underrepresented minorities through national and regional collaborations

**Awards**

- Hispanic Network of Raytheon Company 2001 Scholarship for Technical Honors
- MAES (Society of Mexican-American Engineers and Scientists)
- 2000 Madrina/Padrino Scholarship (1 of top 3, national level)
- 2000 MAES Technical Design Competition (2<sup>nd</sup> place, national)
- 2000 UCLA Women for Change Leadership Award

*More Sosa, next page*

**Sosa continued:**

- 1998 Research Rookie of the Year (UCLA Center for Academic and Research Excellence)

**Publications**

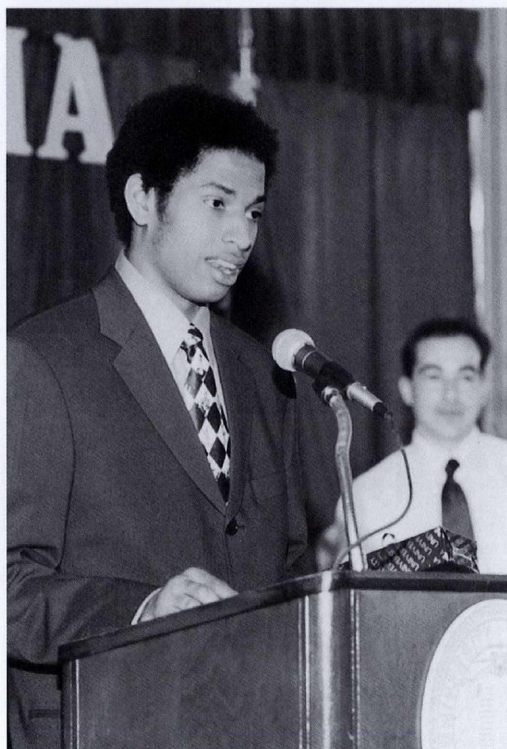
- S. Woerly, V. Doan, N. Sosa, J. Vellis and A. Espinosa, "Reconstruction of the transected cat spinal cord following NeuroGel<sup>TM</sup> implantation: axonal tracing, immunohistochemical and ultrastructural studies," *International Journal of Developmental Neuroscience* 19 (2001) 63-83
- N. E. Sosa, E. Torres, and D. Baugh, "Hydrogen-termination of Si (111) wafers," *The California Alliance for Minority Participation Quarterly* Fall 1998, Volume 7, Number 1 (abstract)

**Work Experience**

- 2000-present: Materials Science and Engineering Department, UCLA
- 1999-2000: Exotic Materials Institute, UCLA  
Built two standard linear curves for quantitative enantiomeric excess determination. (Circular Dichroism spectroscopy, wet chemistry)

**Community Service**

- Speaker and mentor for Century High School students, coordinating visits to UCLA, 1999-2000; Peer Mentor for UCLA Center for Academic and Research Excellence- mentored two undergraduates and have planned activities to create a support net among student in the program, 1998-2000



Yusef Collins, UC Berkeley, accepting Peer Mentor Award

*"Melanie's abilities go beyond her academic strengths and drive. She willingly and enthusiastically takes on leadership roles. Last summer our office ran a pilot program for transfer students; as a transfer student herself, Melanie asked to be involved in the development of the program. Her suggestions for program activities and the types of information that transfer students need were invaluable. She also served as a peer mentor for the students, helping them adjust to the UCSD climate."*

—Dr. David Artis, CAMP regional director, UC San Diego

**MELANIE ZAUSCHER – UC SAN DIEGO****Major**

- Environmental Chemistry, senior

**Transferred From**

- San Diego Mesa Community College

**Educational Goal**

- Pursue a Ph.D.

**Mentor**

- Professor Martin Wahlen, Geoscience Research Division

**Research Experience**

- Scripps Institution of Oceanography/Scripps Undergraduate Research Fellowship (SURF) Summer 2000
- McNair Program administered by Academic Enrichment Programs, Summer 2001

**Presentations**

- CAMP Statewide Undergraduate Research Symposium III, UC Davis, 2001
- Penn State McNair National Research Conference, 2001
- SACNAS National Conference, 2001
- UCSD Multicultural Research Conference, 2001

**Activities**

- UCSD CAMP intern, January- December 2001; research, mentoring, outreach, active in mentoring students to become involved in CAMP; has a "passionate interest" in reaching out to transfer students and encouraging them to take advantage of the resources that UCSD CAMP Science Program has to offer; serves on student panels; speaker at orientation sessions; conference volunteer assisting with poster set-up and oral presentation practice.

*"She [Melanie] can think critically across disciplines and genuinely enjoys intellectual discussions."*

—Dr. Norienne Saign, Coordinator,  
UCSD McNair Program

Fourteen undergraduate presenters received recognition for Special Merit in Life Sciences and Physical Sciences/Engineering for poster and oral presentations. UC faculty, researchers and graduate students served as judges, evaluating both content and delivery of the presentations, with emphasis on thorough and thoughtful explanation of the research. The award winning presentations revealed the researcher's breadth and depth of scientific understanding. Students concur that being judged competitively adds just enough pressure to make the experience that much more valuable. Programs supporting research opportunities, such as Research Experience for Undergraduates (REU), McNair, MESA-MEP, UCLEADS, and AGEP also played a part in preparing students in various ways for the CAMP event.

## SPECIAL MERIT FOR RESEARCH

# Special Merit

### SPECIAL MERIT LIFE SCIENCES, ORAL PRESENTATION & PEER REVIEW AWARD FOR BEST OVERALL ORAL PRESENTATION

*Nicole L. Smolensky*

### SPECIAL MERIT LIFE SCIENCES, ORAL PRESENTATION

*Steve Rivera*

*Juliette Roberts*

*Ana Gomez*

*Jerusalem Tesfai*

### SPECIAL MERIT PHYSICAL SCIENCES, ORAL PRESENTATION

*Jason Gallagher*

*Jose Antonio B. Santos*

*Daniel Vera*

### SPECIAL MERIT LIFE SCIENCES, POSTER PRESENTATION & PEER REVIEW AWARD FOR BEST OVERALL POSTER PRESENTATION

*Chioma Agbo*

### SPECIAL MERIT LIFE SCIENCES, POSTER PRESENTATION

*Maritza Alvarado*

*Jose M. Morachis*

*Tino W. Sanchez*

### SPECIAL MERIT PHYSICAL SCIENCES, POSTER PRESENTATION

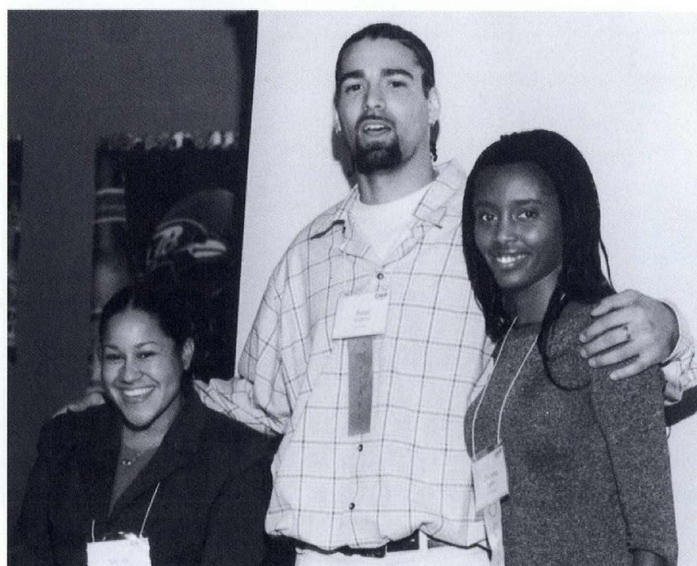
*Ana Gonzalez*

*Arturo Hernandez*

*Nicholas Parra-Vasquez*

### THE PEER REVIEW AWARD: NOMINATED BY PRESENTERS FOR PRESENTERS

Symposium IV presenters had the opportunity to take in as many oral and poster presentations as their schedule allowed and vote for his or her candidates for best overall poster and best overall oral presentation. Nominators were required to provide comments on presenter's style, delivery, content and mastery of the material. UCR's Boaz Cotton, graduating senior and awardee from the CAMP symposium at UC San Diego, solicited the nominations. UCR graduate student Daniel Smith, former CAMP-er and AGEP Fellow, assisted with the final selections. Cotton and Smith recommend that presenters observe as many of their peers as possible to not only provide feedback but also to build their own communications skills. The Peer Review Awards will be a regular feature of future CAMP symposia.



Graduating UCR senior Boaz Cotton congratulates the top nominees from the Peer Review Award, recognizing the overall top oral and poster presenters. The awardees: Nicole Smolensky, UCSC (oral) and Chioma Agbo, UCLA (poster). For these and other student awards, loud applause was encouraged!



“Sometimes the toughest audience is a group of your peers in your own major. They assess the fine points of your research knowledge and your presentation skills. They know how well prepared you are to take broader questions.”

—Daniel Smith, Graduate Student and AGEP Fellow, UCR

**NICOLE L. SMOLENSKY**

**Major:**

- Ecology and Evolutionary Biology; B.S. degree anticipated June 2002

**CAMP Research Presentations:**

- UCSC Undergraduate Symposium 2000 and 2001
- UCLA Undergraduate Symposium Summer 2000
- National SACNAS Conferences, Phoenix, AZ September 2001 and Atlanta, GA October 2000

**Awards & Honors:**

- California Alliance for Minority Participation Research Program (CAMP) Summer 2000
- UCLA Evolution Ecology Organismal Biology Department
- UCSC Evolution Ecology and Biology Department Summer 2001
- Special Merit Oral Presentation – CAMP Statewide Symposium 2002, UC Riverside Activities:
- Veterinary Assistant (Volunteer)
- Chemistry Co-leader, ACE (Academic Excellence Honors Program)
- Volunteer, Society for the Prevention of Cruelty to Animals (Spay/Neuter Clinic)
- Historian, African/Black Student Alliance student organization
- Co-editor, Black/African Voice (student run newsletter)
- Mentor, Services To Students of Color, Umoja
- Volunteer (2nd year) for Expanding Your Horizons (brings Santa Cruz County high school women to UCSC for exposure to careers in science and math)

Profile

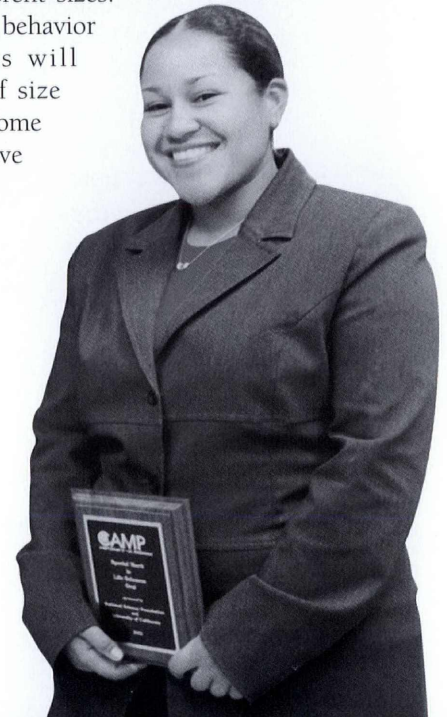
**SPECIAL MERIT IN LIFE SCIENCES ORAL PRESENTATION:**

**NICOLE L. SMOLENSKY**

**Mentor: Barry Sinervo  
Department of Biology,  
University of California Santa Cruz**

**COMPETITIVE BEHAVIORAL PATTERNS IN HATCHLINGS OF UTA STANSBURIANA**

In the side-blotched lizard, *Uta stansburiana*, there are two female throat color morphs, orange and yellow, each with a different reproductive allocation strategy. Yellow females are k strategists producing small clutches of large eggs whereas the orange throated females are r strategists producing large clutches of smaller eggs (Sinervo *et.al* submitted). Hatchlings from orange-throated females tend to be smaller, fast explorers and more aggressive, whereas hatchlings from yellow throated females are larger, slow explorers. Hatchlings from yellow-throated females have higher fitness at high population densities. This is believed to be the result of a size advantage when competing for territories at natal sites. When hatchlings of the same size compete for territory we expect the aggressive hatchlings from the orange-throated mother to out-compete the hatchlings from the yellow-throated mother. To test these predictions we introduced hatchlings into a novel environment and recorded their behavior. The experimental design consisted of three treatments, hatchlings on their own, two hatchlings of the same size, and two hatchlings of different sizes. Differences in hatchling behavior between treatments will highlight the effect of size differentials on the outcome of hatchling competitive interactions.



**SPECIAL MERIT IN LIFE SCIENCES  
ORAL PRESENTATION:**

**STEVE RIVERA**  
*Marilena Karpodinis, Daniel DeUgarte,  
Edward R.B. McCabe*  
*Department of Pediatrics,  
University of California Los Angeles*

INVESTIGATIONS OF ADRENAL STEM CELLS

Adrenal Hypoplasia Congenita (AHC), an X-linked disorder caused by the mutation or deletion of the DAX1 gene, suppresses the development of the adult adrenal cortex and can potentially be fatal if not diagnosed and treated properly. Evidence shows that transplantation of adrenocortical fragments into the gracilis of bilaterally adrenalectomized rats leads to the development of functional adrenocortical nodules. Using this approach to regenerate functional adrenocortical nodules in mice, we plan to identify adrenal stem cells that can eventually provide an alternative method of treatment for individuals diagnosed with AHC. To begin our investigation, we will adrenalectomize a number of mice. The excised adrenal tissue will be sectioned, and fragments of the capsule and underlying cortex will be transplanted into an area with a healthy blood supply. Periodically, assays will be performed to determine the levels of ACTH and corticosterone present in the blood of experimental animals. After three months, the insert will be excised and histologically analyzed to determine the degree of adrenal development. We anticipate that the fragment will develop into a two or three-layered cortex and will secrete normal levels of adrenocortical steroids.

**SPECIAL MERIT IN LIFE SCIENCES  
ORAL PRESENTATION:**

**JULIETTE ROBERTS, ANA GOMEZ**  
*Mika Yoshida, Grace Kim, Ruth Espinoza,  
Michelle Lum, Ann M. Hirsch*  
*Department of Molecular, Cell and  
Developmental Biology,  
University of California Los Angeles*

IDENTIFICATION OF ENOD40 HOMOLOGUES IN  
NODULATING AND NON-NODULATING LEGUMES

The Fabaceae (Leguminosae) is unique in its ability to form symbiotic associations with bacteria of the genus *Rhizobium* and *Bradyrhizobium*. These bacteria bring about the formation of root nodules, where the nodules house and fix nitrogen into ammonia. The plant in return provides carbohydrates to the bacteria. ENOD40 is a plant early nodulin gene involved in nodule development. There are three subfamilies in Fabaceae: Papilionoideae, Mimosoideae, and Caesalpinioideae. Over 80% of Papilionoideae and Mimosoideae nodulate. Caesalpinioideae are presumed to represent the oldest branch of the legume family, where less than 10% of these members nodulate. Doing a phylogenetic analysis of ENOD40 in the Caesalpinioideae may therefore provide clues as to the origin of nodulation. Studies on non-nodulating species has determined that ENOD40 homologues are found in selective non-nodulating legumes, suggesting that either the gene preceded the evolution of nodulation or that the ability to nodulate was lost in these species.

*"I have had the pleasure of attending all four CAMP Undergraduate Research Symposia and continue to be excited by both the content of the outstanding student presentations and what these represent about the future for science, engineering, and mathematics."*

—James Shackelford, Ph.D.,  
Professor of Chemical Engineering  
& Materials Science, UC Davis



**SPECIAL MERIT IN LIFE SCIENCES  
ORAL PRESENTATION:**

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**JERUSALEM TESFAI**  
*Francesco Faiola and Ernest Martinez*  
*Department of Biochemistry,*  
*University of California Riverside*

CANCER ASSOCIATED GENE, C-MYC, SPECIFICALLY  
INTERACTS WITH TRANSCRIPTION COFACTORS

c-Myc (Myc) is an oncoprotein that is found overexpressed and/or mutated in many human cancers. Myc is sequence specific –DNA binding protein that dimerizes with its partner, Max, to bind DNA, activate transcription, and promote cell proliferation, as well as programmed cell death. The carboxyl terminus of Myc is required for dimerization and DNA binding. The amino-terminal third of Myc has transcription activating ability and is required for all its biological functions. The study aims to find transcription cofactors that specifically interact with Myc N-terminal transactivation domain (TAD) to understand how Myc functions as a transcription factor. Affinity chromatography with immobilized GST-Myc fusion proteins and Western blot analyses were used to identify proteins from nuclear extracts of human HeLa cells that specifically bind to the Myc TAD domain in-vitro. Evidence has shown that Myc TAD interacts with the human STAGA coactivator/histone acetylase complex associated and the basal transcription factor TBP (TATA-binding protein). In the cell, TBP is associated with various TAFs (TBP-associated factors) in distinct complexes- SLI, TFIID, and TFIIB- which are required for gene specific transcription by RNA polymerase I, II, and III, respectively. Surprisingly, SLI-, TFIID-, and TFIIB- specific TAFs do not associate with Myc. Thus, results suggest a transcription role of Myc by recruitment of the chromatin-modifying coactivator complex STAGA and perhaps a novel form of TBP.

**SPECIAL MERIT IN PHYSICAL SCIENCES  
ORAL PRESENTATION:**

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**JASON GALLAGHER**  
*Nesrin Sarigul Klijn*  
*Department of Aeronautical and Mechanical*  
*Engineering,*  
*University of California Davis*

SWIFTLAUNCH REUSABLE LAUNCH VEHICLE  
EXTRACTION STUDY.

In any emergency, time wasted could equal a life lost. An International Space Station emergency, if not responded to quickly and safely, could also result in billions of dollars lost. A current research team at the University of California, Davis has figured out a way to prevent the latter from happening, providing a new frontier for space launching methods. Dr. Nesrin Sarigul-Klijn has focused on an air launch method called SwiftLaunch RLV (reusable launch vehicle) which uses a unique parachute air launch method to provide mobility and deployment advantages over ground launching. The SwiftLaunch RLV calls for extracting an approximate 320,000 lb. load from a C-5 aircraft, far greater than the 82,000 lb. load that the C-5 is rated for. The proposed solution is to fly a zero G maneuver during the extraction to prevent overloading the launch ramp and preventing an uncontrollable pitch up as the payload moves backwards. The goal of this study is to construct a simulation of the sled extraction from the aircraft using computer simulation software. The simulation will evaluate the sensitivity that pilot errors create during a “zeroG” maneuver on aircraft and launch vehicle loads. The simulation will also serve as a tool in finding the optimal flight path along which to perform the extraction. An extraction like this has never been attempted before and a realistic physical simulation greatly reduces chances of human error during actual flight testing.

*“The symposium was dedicated to Dr. James Del Castillo. The high caliber of the presentations made it a fitting tribute to his memory. James always had high standards for his CAMP students.... As a judge, it was like observing Olympic athletes. All presenters had clearly worked long and hard on their research topics. This made the judges’ task all the more challenging.”*

—Philippe Relouzat, Ph.D., UCI Learning & Academic Resource Center Math Coordinator

**SPECIAL MERIT IN PHYSICAL SCIENCES  
ORAL PRESENTATION:**

**JOSE ANTONIO B. SANTOS**  
*Mark Duvall, Andrew Frank  
Department of Mechanical  
and Aeronautical Engineering,  
University of California Davis*

QUANTIZATION OF A LIGHT-DUTY NISSAN  
CONTINUOUSLY VARIABLE TRANSMISSION (CVT)

Hybrid electric vehicles (HEV) provide greater fuel efficiency than today's automobiles. This study focuses on improving that aspect of HEVs. Several mechanical properties of a light-duty Nissan continuously variable transmission (CVT) have been quantified. Constant 20, 40, and 60 miles per hour tests were performed on a Clayton chassis dynamometer with a VDT belt and a GCI chain. Furthermore, LA4-505 drive cycle tests were completed with both a cold and hot vehicle engine starting condition. A 1996 Mercury Sable named Coulomb was converted into a hybrid electric vehicle by members of the HEV Center. A SmartGuard data acquisition system collected such data as charge (A\_hr), energy (W\_hr), power draw (kW), voltage (V), current (A), and elapsed time (s); the graphical user interface for Coulomb, on the other hand, recorded important information including speed (mi/hr), electric throttle percentage, regenerative braking percentage, and various other mechanical controls parameters. The constant speed tests at 20, 40, and 60 miles per hour drew an average power of 5, 11.06, and 24.71 kilowatts, respectively, with the VDT belt installed; its counterpart, the GCI chain, drew an average power of 4.61, 11.05, and 23.69 kilowatts, respectively. Regarding energy use, it was found in the 505 hot drive cycle that  $1286.26 \pm 11.16$  W\_hr of energy were used with the VDT belt, while an average of  $1273.02 \pm 2.80$  W\_hr were consumed when the chain was in use. This amounts to a 1.0293 percent difference between belt and chain.

*"This was my first opportunity to serve as a judge at the CAMP Symposium. I was extremely impressed with the quality of the research and the presentations and with the multidisciplinary nature of the projects. The value of the CAMP program was clearly demonstrated, as the students I spoke with had a strong commitment to continuing their education at the graduate level."*

—Gary Ford, Ph.D., Associate Dean,  
College of Engineering, UC Davis; CAMP Regional Director

**SPECIAL MERIT IN PHYSICAL SCIENCES  
ORAL PRESENTATION:**

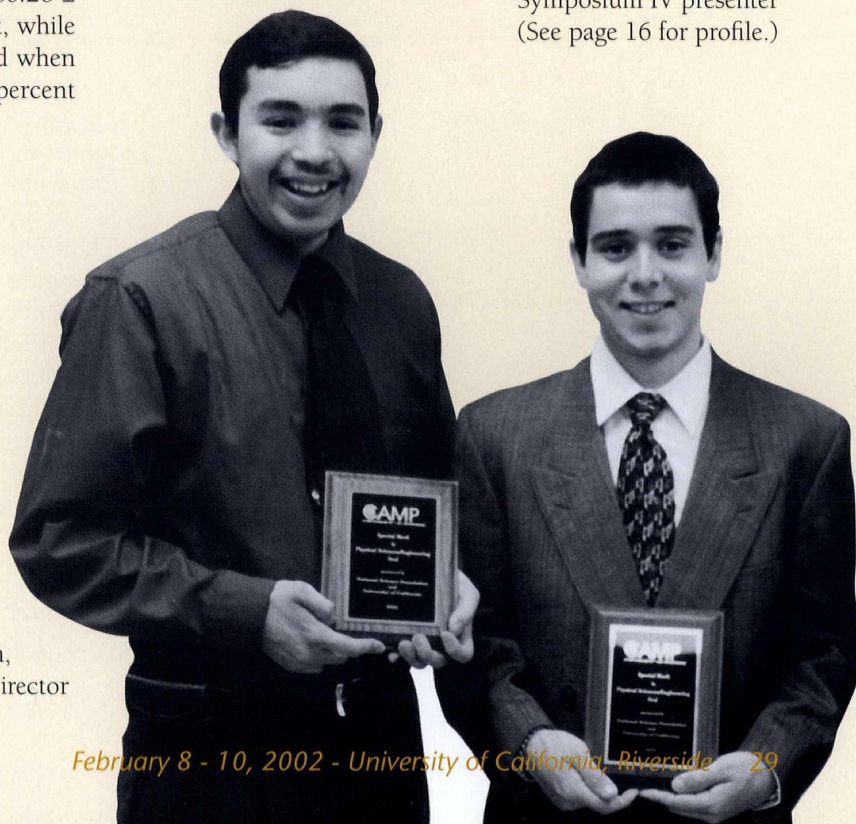
**DANIEL VERA**  
*Professor Bernard Russo  
Department of Mathematics,  
University of California Irvine*

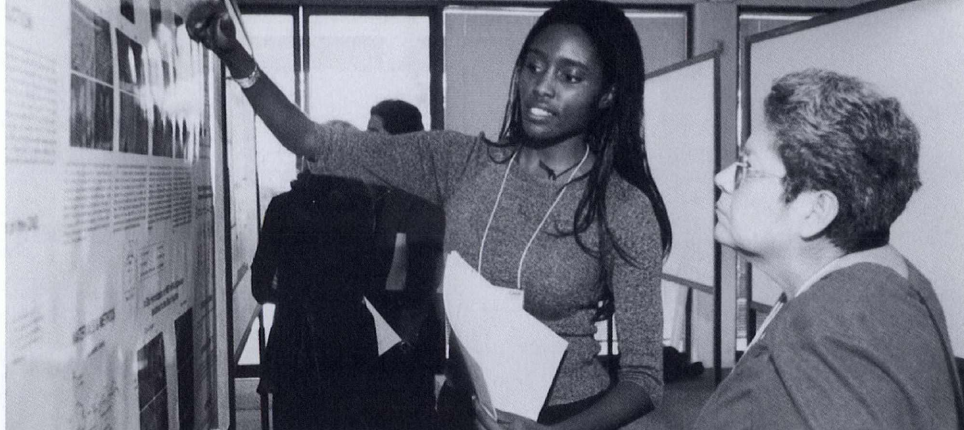
THE ART OF MATHEMATICS

In this survey of the basic topics of analysis, topology, algebra, and dimensionality, certain fundamental ideas of these disciplines are analyzed. An exploration of certain "high end" subjects, such as string theory and chaos theory, is also presented. The goal of this study is to develop one's comprehension of these basic notions for the purpose of a future discourse that will examine one of these modern subjects in detail. We begin with a brief history of the development of certain mathematical ideas, their current temporal applications, and extrapolate some basic results from intuitive definitions of string theory and dimension.

*"Conference experiences (2001 SACNAS National Conference and CAMP Symposium) have enriched me as a scientist because I have been involved with hands-on research using the scientific method. I also learned to work independently, to work under time constraints, and to overcome many challenges that are usually encountered in experiments conducted in the field and in the lab."*

—Zulma Vasquez, UCR biology major,  
UC-Edison Scholar,  
Symposium IV presenter  
(See page 16 for profile.)





## CHIOMA AGBO

### Major:

- Double major in Physiological Science and Neuroscience; B.S. degrees anticipated June 2003

### Laboratory Research Experience:

- UCLA/NIH Summer Biomedical Enrichment Program, 1999
- HIV/Digestive Diseases Lab, Dr. Peter Anton, 2000-2001
- Mental Retardation Research Center, Dr. Araceli Espinosa, 2000-present

### Awards & Honors:

- Jackie Robinson Academic Scholar, UCLA
- Special Merit in Poster Presentation, CAMP Statewide Undergraduate Research Symposium

### Activities:

- Student Health Advocate, UCLA Arthur Ashe Center
- Care Extender Intern, Santa Monica-UCLA Hospital

Profile

## SPECIAL MERIT IN LIFE SCIENCES POSTER PRESENTATION:

### CHIOMA AGBO

*Mentors: O.O. Awosika; P.M Zhao; J. De Villis, Ph.D;  
A. Espinosa, Ph.D.*

*Mental Retardation Research Center,  
University of California Los Angeles*

### TRANSFERRIN AND IGF-1 INJECTED INTO THE BRAINS OF MYELIN DEFICIENT RATS SUPPORT LINEAGE PROGRESSION OF OLIGODENDROCYTES

Myelination is necessary for proper electrochemical conduction of information in the central nervous system. Partial myelination or lack of myelin results in central nervous system dysfunction and in most cases can be lethal. Myelin deficiency occurs in acquired diseases such as multiple sclerosis and Parkinson's disease or inherited conditions such as Pelizaeus Merzbacher. Oligodendrocytes are cells in the central nervous system that form and maintain myelin by synthesizing proteins such as myelin basic protein (MBP), proteolipid protein (PLP) and transferrin among others. The long-term goal of this project is to increase the number of functional oligodendrocytes to increase myelination. Our dysmyelination model is the myelin deficient (md) rat. Previous research in this laboratory involved the injection of insulin-like growth factor 1 (IGF-1), transferrin and combination of IGF-1/transferrin into the md brains following the hypothesis that the injections would cause an increase in oligodendrocytes in the md rat brains. Examination of sagittal sections showed that the administration of Tf+IGF-1 combined increased PLP mRNA, and MBP and transferrin immunoreactivity, indicating OL maturation. Coronal sections were also used to compare the effect of these factors in the contralateral and ipsilateral hemispheres. Preliminary results showed an increase of PDGRR-AA mRNA in the subventricular regions in the normal treated brain and, a more generalized increase in both ipsilateral and contralateral hemispheres in the md rat.

*“It takes more than meets the eye to deliver a highly successful poster presentation. The peer award for best overall poster is definitely something to be proud of.”*

—Marjorie DeMartino, CAMP Statewide Associate Executive Director



**SPECIAL MERIT IN LIFE SCIENCES  
POSTER PRESENTATION:**

**MARITZA ALVARADO**  
*Michele Ono, Anat Biegon*  
*Lawrence Berkeley National Laboratory*

REGION SELECTIVE EFFECTS OF LPS-INDUCED  
NEUROINFLAMMATION IN THE RAT BRAIN

Neuroinflammation appears to play a role in neurodegenerative disorders and is accompanied by increases in peripheral type benzodiazepine receptors (PTBR) in the brain. The effects of neuroinflammation induced by an intracisternal injection of endotoxin (LPS) on PTBR and glutamate NMDA receptors (NMDAR) were studied in various rat brain regions using quantitative autoradiography. Rats were killed 7 days post injection and frozen brain sections were incubated with  $^3\text{H}$ -PK11195 or  $^{125}\text{I}$ -iodoMK801 to label PTBR and NMDAR respectively. PTBR density was significantly increased in LPS-treated animals in a region-specific manner. The biggest increases were seen in entorhinal cortex, temporal cortex and ventral hippocampus. Smaller, but still marked increases were measured in substantia nigra, subfields of the dorsal hippocampus, and medial geniculate. No significant changes were seen in striatum, cerebellum, several cortical and hypothalamic regions and the choroid plexus. Thus, intracisternal injection of LPS produced elevations in PTBR binding, previously shown to be associated with microglial activation and neuronal death, and a concomitant reduction in NMDAR.

**SPECIAL MERIT IN LIFE SCIENCES  
POSTER PRESENTATION:**

**JOSE M. MORACHIS**  
*Ruben Alarcon*  
*Department of Biology,*  
*University of California Riverside*

SPATIAL VARIATION IN PLANT POLLINATOR  
INTERACTIONS FOR GERANIUM RICHARDSONII

Angiosperms are the most diverse group of plants. This great variation is partly due to the relationship of the flowers and their pollinators. Although flowering plants have coevolved with and adapted to specific pollinators, little attention has been paid to spatial variation in such interactions. Over time if different insects pollinate a species at different sites, plant populations may evolve to fit their particular pool of pollinators. The purpose of this study is to document the degree of spatial variation in plant pollinator interactions for *Geranium richardsonii* between two sites 2km apart to see if the potential for local adaptation exists for this species. The results show that there is some variation in pollinator species. Both sites were statistically equal in species diversity; however, the species that comprise the pool of pollinators were different between sites. When the insects were grouped into higher taxonomic groups, such as bees, beetles, butterflies etc., the two sites showed no significant variation. Further studies need to be done to determine if this degree of variation is sufficient enough to cause directional selection.

*“Through the research presented here, students learn the mechanics of how to think like a scientist and act like a scientist. Curiosity in the subject matter has been fostered and nurtured. The laboratory experience and the mentoring throughout add up to a successful picture.”*

—John de Pillis,  
Professor of Mathematics,  
Emeritus, CAMP Regional  
Director, UC Riverside



**SPECIAL MERIT IN LIFE SCIENCES  
POSTER PRESENTATION:**

**TINO W. SANCHEZ**  
*Diane Lawrence, and Eugene Major*  
*National Institute of Neurological Disorders  
and Stroke, Bethesda, MD*

MOLECULAR REGULATION OF HUMAN MONOCYTE  
CHEMOATTRACTANT PROTEIN-1 IN SVG  
IMMORTALIZED HUMAN ASTROCYTES AND THEIR  
CONVERTED NEURONAL DERIVATIVES

Pro-inflammatory immune response to HIV-1 in the brain is associated with an increase in human monocyte chemoattractant protein (hMCP)-1 production and neurological disorders, like HIV-1 encephalopathy. The source of hMCP-1 in HIV-1 infected brains is believed to come from critical support cells called astrocytes. To prove this claim, our project involves using a cell culture model system to study the molecular regulation of hMCP-1 production in SV40 glial (SVG) immortalized astrocytes. Critical regions of the hMCP-1 promoter is incorporated into plasmids by transfection then stimulated for comparison of hMCP-1 production and regulation in SVG astrocytes and their converted neuronal derivatives. SVG cells produce moderate levels of hMCP-1 in culture under normal conditions. Although in the presence of interferon (IFN)- $\gamma$  and tumor necrosis factor (TNF)- $\alpha$ , an increase of hMCP-1 levels are observed. When SVG cells are converted to a neuronal phenotype, the baseline level of hMCP-1 production is drastically reduced and the cells lose responsiveness to IFN- $\gamma$ . By comparing both cell phenotypes, we can study the regulation of hMCP-1 in an HIV-1 infected brain.

**SPECIAL MERIT IN PHYSICAL SCIENCES  
POSTER PRESENTATION:**

**ANA GONZALEZ**  
*Kuria Ndungu, A. Russel Flegal*  
*Department of Environmental Toxicology,  
University of California Santa Cruz*

SPATIAL GRADIENT IN CHROMIUM CONCENTRATION  
AND SPECIATION IN THE AROMAS RED SANDS  
AQUIFER

In order to address the concerns of chromium concentrations in drinking water for Santa Cruz County, we designed a study to investigate the source(s) and spatial gradients of chromium concentrations and speciation in local aquifers. This study was catalyzed by a recent report (January 2001) by the Soquel Creek Water District where elevated hexavalent chromium [Cr(VI)] concentrations ranging from 6 to 36 parts-per-billion (ppb), approaching the state's Maximum Concentration Limit (MCL) of 50 ppb, were found in their Aromas Red Sands Aquifer. To test the accuracy of those preliminary measurements, we collected tap water using trace metal clean techniques from ten sites in Santa Cruz County, including seven from the aquifer with reportedly elevated chromium concentrations, and analyzed them for total chromium using atomic absorption spectrometry. Five of these seven sites had chromium concentrations ranging from 9 to 18 ppb, while the three from the control site were all below the limit of detection. We also measured the speciation of chromium at two of the contaminated sites, and determined that greater than 85% of total chromium was Cr(VI), which is the toxic form of chromium. Although these values are below the state's current MCL, they still represent an environmental and health concern that needs to be addressed.

*"CAMP provides our undergraduate students with that most rare commodity, i.e., a one-to-one faculty-mentored experience in the modes of scientific inquiry. At each of the annual CAMP conferences I've been fortunate enough to attend, I continue to marvel at the tremendous thrill our students achieve through both engaging in serious research and presenting it before their peers. As many of these students are quick to tell you, the CAMP experience has changed the course of their lives, starting them down pathways that would have otherwise likely remained unnoted and untrod. "Two roads diverged in a yellow wood, and sorry I could not travel both . . . ." Without CAMP, far fewer of our students would have the chance of discovering that unique pathway leading to the rest of their lives."*

—Loren Thompson, Assistant Vice Chancellor, UC San Diego

**SPECIAL MERIT IN PHYSICAL SCIENCES  
POSTER PRESENTATION:**

**ARTURO HERNANDEZ**  
*Truong Vu, Jeff Suri & Bakthan Singaram*  
*Department of Chemistry,*  
*University of California Santa Cruz*

**TARBCAT-X, AN INEXPENSIVE YET HIGHLY SELECTIVE  
CHIRAL LEWIS ACID CATALYST**

A highly selective chiral Lewis acid catalyst, TarBcat-X, derived from an aryl boronic acid and (L)-tartaric acid was prepared. High enantioselective reduction of Acetophenone to its corresponding alcohol in the presence of TarBcat and LiBH<sub>4</sub> was achieved. (L)-Tartaric acid, which is found in household wine, is easily obtainable and is the precursor to our inexpensive yet highly selective catalyst. In comparison, metal-based catalysts containing Zn, Pt and Pd are expensive and not readily available. Analysis was performed using a chiral column gas chromatograph. The reduction products were obtained: 96% enantiomeric excess, 89% isolated yield with 80% recovery of the boronic acid. Further work using other substrates will continue and the overall utility of TarBcat-X will be determined.

**SPECIAL MERIT IN PHYSICAL SCIENCES  
POSTER PRESENTATION:**

**NICHOLAS PARRA-VASQUEZ**  
*Alex Katz*  
*Department of Chemical Engineering,*  
*University of California Berkeley*

**FUNDAMENTAL STUDY OF SELECTIVE CATALYSIS IN  
HETEROGENEOUS MATERIALS**

The objective of this research is to investigate the significance a catalyst's structural features have on the pore size comprising the framework and the degree of observed shape-selectivity. To accomplish this, a new material containing microporous active sites in silica within a mesoporous framework was synthesized and characterized by nitrogen adsorption. This material exhibits a bimodal pore-size distribution comprising imprint micropores and framework mesopores using nitrogen physisorption experiments. The shape selectivity exhibited by this material in catalyzing the Knoevenagel condensation of isophthalaldehyde and malononitrile was compared and contrasted with a control. The control comprised a microporous imprinted silica that lacks mesoporosity. This study permits the elucidation of the relative importance of framework porosity on catalyst selectivity for the same active site. Imprinting is used as a method to vary one attribute of the catalyst independently (framework porosity) while keeping all other attributes of the catalyst constant.



## Ruben Alarcon's CAMP Summer Research Program: **Ecology of Plant-Pollinator Interactions**

# Tentative Outline:

- WEEK 1: *Learn field techniques, begin collecting field data, and select a project***  
Seminar: Current issues in pollination biology  
Assignment: Reading of classic papers in pollination ecology.
- WEEK 2: *Work***  
Seminar: What goes into a poster and oral presentation  
Assignment: Draft of introduction and methods section due.
- WEEK 3: *Forth of July!***  
Seminar: Natural history of San Bernardino Mountains  
Assignment: Introduction and methods section due.
- WEEK 4: *Work hard***  
Seminar: How do I get into graduate school  
Assignment: Abstract due. Outline personal statement.
- WEEK 5: *Work harder***  
Seminar: White lies and lies: Data summary and statistics  
Assignment: Curriculum vitae due. Begin data analysis.
- WEEK 6: *Work even harder!***  
Seminar: What does a professor really do?  
Assignment: Preliminary figures and tables. Draft of result section due.
- WEEK 7: *No sleep!***  
Seminar: What is grad life like?  
Assignment: Figures, tables, and results due. Draft of conclusions due.
- WEEK 8: *Caffeine becomes your best friend***  
Seminar: Practice oral presentations  
Assignment: Poster presentation due.

### **Program description**

An 8-week research program (June 18 - August 10) for five students in the San Bernardino Mountains, studying plant-pollinator interactions at the community level in order to address the issue of specialization. We will collect pollinators in the field, identify insects, and analyze pollen loads Monday-Thursday and return to UCR on Friday afternoons for seminars. Each student will be given a project and is required to make a 15-minute PowerPoint and poster presentation.

### **Prerequisite:**

CAMP membership or eligibility, Completion of Bio 5 series

### **Objective:**

Provide students with an opportunity to 1) gain research experience, 2) familiarize themselves with scientific culture/community, 3) learn about the graduate school application process, 4) give a scientific presentation, and 5) improve scientific writing skills.

Applicants must possess an interest in the outdoors, a good attitude, a strong work ethic, and a pair of hiking boots and old jeans! NO Whiners or Wimps allowed! Contact the CAMP Program or Ruben Alarcon [ralarcon@mail.ucr.edu](mailto:ralarcon@mail.ucr.edu) for more info!

*“At a young age I discovered that I was interested in ecology. I spent endless hours in my grandmother’s garden watching both pollinators and herbivores interact with her plants. But it was not until I entered college that I was able to pursue my interests through research. I participated in several research projects during my undergraduate career, but the one experience that has most influenced my career objectives was my recent participation in the Research Experience for Undergraduates Program at the Rocky Mountain Biological Laboratory (RMBL) in Gothic, Colorado. This experience was very important because I was involved with the project from its design to the writing of the manuscript. My experience at RMBL allowed me to improve my scientific skills, develop my own interests in ecology, devise a research plan and identify appropriate graduate programs and mentors.”*

—Ruben Alarcon, UCR graduate student

# How Do I get into Graduate School?

By Ruben Alarcon

## Ten Tips

- 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 current literature in 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! It is just like the SAT. If you are familiar with the format of the exam and the types of questions they ask you can increase your test scores dramatically. Study guides and old exams work!
- 5.) Contact 5-6 professors you would like to work with. Contact them 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. Give them a week or so to get back to you. If they are positive keep in touch with them throughout the application process. In your email let them know: a) who you are; b) what your accomplishments are (grades, research experience etc.); c) your research interests; and d) 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? Remember you need to take care of your social/emotional status because graduate life is a rather stressful time.
- 7.) Work on your personal statement/research interest for at least 4-6 weeks. Have others proofread your work. 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. The best is to bring in your own money from a big fellowship (i.e. NSF or Ford).
- 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!

## ACKNOWLEDGMENTS

### **Keynote Speakers**

James W. Sandoval, *Vice Chancellor Student Affairs, UC Riverside*  
Robert C. Haddon, *Distinguished Professor, Chemical and Environmental Engineering, UC Riverside*

### **Special Guests**

Juan Arratia, *Principle Investigator MIE Project, Universidad Metropolitana, San Juan, Puerto Rico*  
Loren Thompson, *Assistant Vice Chancellor Student Affairs, UC San Diego*  
Marie Steward, *UC LEADS/AGEP Director, UC Riverside*  
Sarah Richards Axford, *CAMP Coordinator, UC San Diego (1997-2001)*  
Victor Chavez, *UCLEADS/AGEP, UC San Diego*  
Mario Robles, *AGEP Coordinator, UC Irvine*

### **UC Riverside Undergraduate Student Volunteers**

Boaz Cotton	Carlos Gaeta
Ana E. Garcia	Valencia Robinson
Omar Ureta	Maximiliano Vallejos

### **Symposium IV Coordinators UC Riverside**

Teresa R. Cofield, *CAMP Coordinator*  
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### **The UCR Learning Center Administration and Staff**

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Efeei Chen, *Post-Doctoral Fellow, Chemistry, UC Santa Cruz*  
Margarita Curras-Collazo, *Associate Professor, Cell Biology and Neuroscience, UC Riverside*  
John de Pillis, *Professor, Mathematics, UC Riverside*  
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Daniel Smith, *Graduate Student, Microbiology, UC Riverside*  
Jolinda A. Traugh, *Professor, Biochemistry and Associate Dean, College of Natural/ Agricultural Science, UC Riverside*  
Richard L. Weiss, *Professor of Chemistry and Biochemistry, UC Los Angeles*

*“CAMP has created an aura of friendship.”*

—Maximiliano Vallejos, UCR, biology freshman

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**These 29 Alliances represent a national network of support and a common goal: B.S. degree completion in STEM (Science, Technology, Engineering, Mathematics) for underrepresented minority students.**

\*Original six "Grand AMPs" funded in 1991



COVER: The UC Riverside carillon was provided by a contribution from UC Regent Phillip L. Boyd and his wife, Dorothy Marmon Boyd, in 1966, which enabled the school to purchase the 48-bell, thirty-thousand pound carillon and build a tower to house it. The carillon was ordered from the Les Fils de Georges Paccard in Annecy-le-Vieux, France. The largest bell in Europe, the 20-ton "La Savoyarde" at the Basilica of Sacré-Coeur, Montmartre was cast by the Paccard foundry. The carillon bells were raised on June 24, 1966. The tower architect was the Los Angeles firm of A. Quincy Jones and Frederick E. Emmons, built by the Brezina Construction Company of Pomona.

A carillon consists of twenty-five or more cast bronze cup-shaped bells, arranged chromatically, and precisely tuned so that many bells can be sounded harmoniously together. The bells are sounded by striking a series of wooden levers with the side of the hand or fingers and by the feet. The first carillon in the United States was installed in 1856 at Notre Dame University. Other carillons in California are on the Stanford University campus and at the Universities of California in Santa Barbara and Berkeley.