California State University, Fresno’s new $22 million Science II Building opened for classes on January 19, 2005—the largest academic building completed on campus since the Kremen School of Education.

The new classrooms can serve close to 900 students at any one time and will open up many new research opportunities, said Dr. Robert Levine, former associate dean of the College of Science and Mathematics. The new building houses departments from the College of Science and Mathematics along with the Criminology Department from the College of Social Sciences.

On any given day, 3,500 to 4,000 student classroom hours will be logged as other departments on campus will also hold classes in the new state-of-the-art facility. “There are ample and first-rate laboratory facilities for Earth and Environmental Science, Physics and Psychology that will open up many new research opportunities for both our students and faculty,” said Levine.

The new 71,000-square-foot building includes lecture halls and instructional labs for earth and environmental sciences and psychology classes, the Science and Mathematics dean’s complex, and graduate research and special instructional areas for the physics department to support the physics program.

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MESSAGE FROM THE DEAN

Dr. Kim-Ping Wong

This has been an exciting year, starting with the completion of our new Science II Building and the Downing Planetarium Museum. We are well on our way to achieving our vision for the Central California Science Center. The construction of the Science II building in the Central California Science Center will provide the focal point for the College to serve K-18 students, teachers and the community. The new Science II Building is the anchor building for the continuing development of the center. The Department’s of Earth and Environmental Sciences, Psychology, Criminology, Computer Science, and the Dean’s Office are located in the new Science II building. Large, inviting spaces for public and student use have been created and the building offers open facilities, enhancement of the learning environment and the development of learning communities. The Downing Planetarium Museum will provide novel exhibits and hands-on activities for students of all ages and will complement the Downing Planetarium. This structure will further enhance the public presence of science on campus and in the community. It promises to enlarge the learning experience of the thousands of school children who visit the planetarium each year. We are extremely grateful to Dr. and Mrs. Thomas Downing for their continued generosity and support of the College of Science and Mathematics. Faculty in the College of Science and Mathematics continue to strive for academic excellence. The faculty submitted forty-four (44) applications for outside grants for a total of more than 3.5 million dollars. In addition, we were awarded approximately $600,000 in new grants and contracts. As of April 30, 2005 the College of Science and Mathematics received 1.9 million dollars in grants and trusts. We are working diligently to enhance the educational opportunities for our students and provide research opportunities for our faculty. The College has been active in the formation of new educational programs to serve the diverse needs of society and provide educational opportunities for students of the central valley and beyond. New programs within the college include progress in implementing a stand-alone Environmental Science degree to complement the joint degree with UC Riverside. The new Biomedical Physics program is underway. Psychology is advancing its new and promising program in Applied Behavioral Analysis. The new M.S. in Forensic Science will begin in the Fall of 06. We continue to expect our membership in the California Cooperative Ecosystem Studies Unit (CESU) to provide abundant opportunities for faculty and students in local conservation programs. A partnership between the Department of Biology and Chemistry for a degree in Biotechnology has been formed. A joint venture with the College of Arts and Humanities in Cognitive Science is also being established. As you can see from a glance by our continuing partnerships, we strive to provide the highest quality of education.

As I reflect on the progress we have made, and particularly the support of our alumni and friends, I am reminded that throughout history, notably in the medieval times, kings, queens, noblemen, and the wealthy were the patrons of the arts and sciences. Through their interest and support, science and the arts flourished, and this continued to the Renaissance of our culture. The faculty, staff, and students of the College of Science and Mathematics look forward to your continued support, guidance, and participation in educating our future generation. Please feel free to contact my office for a visit or to meet with our faculty to explore ways that we can work together to serve our students. May you and your loved ones have a wonderful and prosperous year.

ASSOCIATE DIRECTOR OF BIOTECHNOLOGY AND FORENSIC SCIENCE

Tambría Banc joins the Biology and Chemistry Department as the new Associate Director of Biotechnology and Forensic Science. Tambría brings over 12 years of program development, marketing, fund development and board and committee experience to Fresno State.

ASSOCIATE DEAN

Karen Carey has been a faculty member at California State University, Fresno in the Department of Psychology since 1989. She obtained her BA in Psychology from San Diego State University, her MS in School Psychology from the University of Nevada, Las Vegas, and her Ph.D. in School Psychology from the University of Cincinnati. Dr. Carey’s research interests include interventions for at-risk preschool children and psychosocial assessment.

Dr. Carey was Co-Director of the Joint Doctoral Program in Educational Leadership from 1995 to 1998. She served as Department Chair of the Psychology department for two years prior to being appointed Associate Dean. She has published four books in the areas of preschool assessment interventions, multicultural issues and assessment, has written several articles, and has presented at numerous conferences over her career.

DOWNING, continued from page 1

is to have new exhibits regularly in place,” said White. “After school field classes view the planetarium show they can go over to the museum for an activity or to see the interactive displays.” Fresno State students will lead the activities, act as docents and help build exhibits. White said the museum will be geared toward children in grades kindergarten through sixth, but older children and adults will find it interesting as well. “They will all take away something a little bit different,” he said. Paul Miller of the planetarium.org.

ASSOCIATE DIRECTOR OF BIOTECHNOLOGY AND FORENSIC SCIENCE

Dr. Karen Carey

Ms. Roxanne Hinds began her career at California State University, Fresno in August, 2005 as the College of Science and Mathematics Development Director. She has a rich history in university advancement work including successful fundraising for the University of California, Berkeley, Washington State University, Weber State University and the Ogden Weber Applied Technology College.

Russie Hinds

Roxanne earned her bachelor’s degree from Weber State University in December 2000. She was Summa Cum Laude.

DEVELOPMENT DIRECTOR

Golden Key Honors Society, Phi Kappa Phi, and Outstanding Student of the Year from the Communication Department. Roxanne was an adjunct faculty member at Weber State University from 2002 until moving to Fresno in 2005 teaching Interpersonal and Small Group Communication.

The Vernal Group in Fresno is the museum architect and Don Pickett & Associates is the builder.

The planetarium, which opened in 2000, has a 74-seat star theater with a 30-foot dome. The Downing family’s gifts to date to the university total $3,125,000 for science scholarships and the Downing Planetarium.

In addition to visits from school children, the planetarium is open for public shows on the weekends. For more information on the museum and the planetarium, call (559) 278-4121 or see www.downing-
Dr. Richard Houghten, founder and president of a medical research institute, received California State University, Fresno’s Distinguished Alumnus Award at the Top Dog Alumni Awards Gala on Thursday, Oct. 13. The Distinguished Alumnus Award is the highest honor given by the Fresno State Alumni Association.

Dr. Richard Houghten is internationally recognized as an expert in the fields of molecular diversity combinatorial chemistry and peptide chemistry. He received his bachelor of science in chemistry from Fresno State in 1968, and his doctorate in organic chemistry from the University of California, Berkeley in 1975.

In 1985, Dr. Houghten founded his first company, Multiple Peptide Systems, to commercially synthesize peptides for the research community. He founded Torrey Pines Institute for Molecular Studies in 1988, a not-for-profit research center dedicated to the discovery of treatments for a number of devastating diseases, including Multiple Sclerosis, Alzheimer’s disease, heart disease, many types of cancer and AIDS.

He most recently founded Mixture Sciences, Inc., a company focused on the discovery of therapeutic and diagnostic candidates using its proprietary mixture-based peptide, peptidomimetic and small molecule combinatorial technologies. Dr. Houghten has received various awards acknowledging his contributions to the fields of combinatorial chemistry, peptide chemistry and basic research, including the 1996 San Diego Distinguished Scientist Award from the American Chemical Society and the first Athena Individual Pinnacle Award in 1999 for molecular diversity combinatorial technologies.

Dr. Houghten has received patents. Houghten founded the journal Peptide Research, now called, The Journal of Peptide Research (the official journal of the American Peptide Society), and is co-editor-in-chief of the journal Molecular Diversity.

He was co-chair of the 2nd International Peptide Symposium in San Diego in 2001, and has served both as the Secretary and Treasurer of the American Peptide Society. He has recently been asked by President John Welty to participate in Fresno State’s Entrepreneur-in-Residence Program later this fall.

Dr. Thomas Downing was born in Fresno, the son of Dr. and Mrs. Harold Downing. While attending Fresno State, Tom was a member of Sigma Chi Fraternity and served as the chapter’s president in 1967. Tom graduated from Fresno State in 1970 with a Bachelor of Science Degree in Zoology. He earned his dental degree from New York University, College of Dentistry, in 1974. He was drafted and served in the Vietnam War.

Tom’s father, Dr. Harold Downing, was a practicing orthopedist, as well as a very astute investor. His wife, mother and sister are all graduates of Fresno State. Tom is currently a self-employed dentist and has been in business at the same location since 1977.

Tom and his wife, Cynthia, were instrumental in arranging more than $3 million in donations to Fresno State for science scholarships and the Downing Planetarium, which was completed in 2000. Tom and Cynthia worked actively to promote the planetarium in the community and served as chair and secretary of the planetarium committee.

Tom is currently the chairman of the Reedley City College Dental Advisory Committee, chairman of the Downing Planetarium Oversight Committee and chairman of the board of the Professional Exchange Service Corporation in Fresno.

He is founder and past president of Central Valley Dental Partners and is a member of the Friends of the Mendenhall Library, Fresno State’s Pinnacle Society and the Fresno State Alumni Association.
The College of Science and Mathematics and the Department of Psychology, along with the student-run Fresno State ABA Club, sponsored a community outreach behavior analysis conference on October 14. The conference was held in the University Business Center and was attended by over 130 people. Participants included students and staff from Central Valley State and other local universities, as well as numerous behavior analysts, teachers, school psychologists, counselors, regional center personnel, and parents from across the Central Valley and surrounding areas.

Applied Behavior Analysis (ABA) is an area of psychology that examines how environmental variables affect human behavior and how environments may be changed so that people may lead more successful, productive lives. Behavior analysts work in a multitude of settings, including schools, group homes, clinics, hospitals, and private agencies. They serve both children and adults with a range of behavioral issues, including autism and other developmental disabilities, as well as classroom management, and self-management.

The ABA conference was designed to provide information about behavior analysis not only to Fresno State students and staff, but to members of the Central Valley Community. This year’s conference focused on how ABA can be used to improve the lives of children. Three prestigious behavior analysts provided keynote addresses at the conference. Dr. James Partington (Pleasant Hill, CA) gave a presentation on ABA approaches to autism treatment with young children. Dr. Partington has been featured on such programs as Dateline and 20/20 and is known both nationally and internationally for his work with children with autism. Dr. Janet Twyman (Seattle, WA) presented information on an ABA-based reading program called Headsprout, which has taught thousands of at-risk children across the country to be fluent readers. Dr. Twyman is the Vice President of Instructional Development for Headsprout and also serves as a council chair on the National Association for Behavior Analysis’s Education Board. Dr. Hayley Heitzig (Gainesville, FL) explained how ABA has been used to improve family placement outcomes for children within Florida’s foster care system. Dr. Heitzig is a professor at the University of Florida and a co-director of Florida’s Family Safety Initiative in the Department of Children and Families. He is also a past-president of the Florida Association for Behavior Analysis.

In addition to keynote addresses, several other behavior analysts presented sessions on behavior analytic applications for both typical and developing children and children with developmental disabilities, including autism. Department of Psychology faculty Jennifer Austin and Criss Wilhite shared their expertise in the history of ABA and behavior analytic applications in general education. Additional presentations were offered by Drs. Mark and Amanda Adams, Dr. Bob Holdaembeck (Lompoc, CA), and Mr. Sergio Pinto (Sacramento, CA).

The conference was coordinated by the Fresno State ABA Club, which is a student-run organization whose mission is to facilitate educational and professional growth for both undergraduate and graduate students interested in behavior analysis. Specifically, it provides additional ABA learning opportunities, materials, handling conference registration both before the conference and on-site, and arranging for travel of out-of-town speakers. In addition, select students researched each speaker’s accomplishments and provided introductions for the speakers prior to their presentations. Although many club members worked hard to make the conference a success, special thanks go to Jason Marshall (ABA Club President) and Hayley Heitzig (ABA Club Vice President) for their outstanding leadership and organizational skills. The ABA Club and advisors also are indebted to the faculty and staff of the Department of Psychology and Dean’s Office for all their assistance and encouragement. We especially thank Dr. K.P. Wong for his untiring support of the advancement of behavior analysis in our college.

ABA Training
Our Applied Behavior Analysis (ABA) training includes undergraduate and graduate tracks in the Department of Psychology. Both tracks meet the academic content required for certification by the national governing body for behavior analysts, the Behavior Analyst Certification Board (BACB). Our course sequences have been approved by the BACB. Upon graduation, students are eligible to sit for certification examinations. People with this certification can become vendors with the state-funded, no one yet knows what these cues are, or how they are represented in the auditory or visual stimulus.

Several recent projects have investigated the existence and use of these cross-modal cues by distorting acoustic speech signals and examining the distortion’s effect on perceivers’ ability to integrate. In one study, it was determined that linear transformations of the frequency spectrum of the acoustic pattern preserve the brain’s ability to integrate auditory and visual speech, but that non-linear transformations of the frequency spectrum do not. This indicates that cross-modal cues are distributed over the entire frequency spectrum of the acoustic signal, and that interrelationships among acoustic components are necessary to be the carriers of cross-modal information. In another set of studies, it was determined that cross-modal cues can be useful for identifying voices, in addition to the linguistic content of an utterance.

Currently, the lab is investigating the utility of these cross-modal cues in the development of speech perception in children. This research has applications in training children with hearing aids to better understand spoken language, and in the programming of computers to perceive natural human speech.

Dr. Timothy Vollmer
Dr. Janet Twyman
Criss Wilhite
Hayley Heitzig
Jason Marshall
Dr. Jennifer Austin
Dr. Steven Blumenshine has established an active and funded research program in California watersheds and surface waters, which includes undergraduate and graduate students. His research interests tend toward the interface of freshwater aquatic communities and ecosystems. Research funding is driven by the importance of understanding factors which may compromise surface water quality in California, and the inequity of water demand versus supply. Within this focus is an emphasis on how human impacts such as hydrological manipulation, nutrient loading, and fish management affect the structure and function of food webs, and the consequences for ecosystem processes. Dr. Blumenshine is particularly interested in how these perturbations affect food webs and the consequences for energy and nutrient flow through ecosystems.

Since Dr. Blumenshine’s arrival to California State University, Fresno in 2001, he has been addressing these issues through funded research for projects across a variety of aquatic ecosystem types, including: headwater streams of the Sierra Nevada range, Central Valley foothill watersheds and reservoirs, vernal pools, flooded agricultural fields of the Tulare Basin, and rivers in northern Thailand (in collaboration with Chiang Mai University).

**EARLY LEARNING CENTER VISIT**

On May 2 Richell Swallow brought her preschool students (ages 3-5) to visit the exhibits and displays in the new Science II building. The tour was lead by Psychology faculty member Martin Shapiro. The kids greatly enjoyed all the exhibits from Saber Cat skull to the Amphibian rain forest exhibit. Dr. Shapiro brought out some of the large stick insects from one of the exhibits and allowed the students to look at them up close and, if brave enough, touch them. The children learned a great deal and were full of questions about all the displays and animals.

**CAREER OPPORTUNITIES IN RESEARCH PROGRAM (COR)**

Drs. Lynnette Zelezny and Christine Edmondson from the Department of Psychology are Co-Directors of the Career Opportunities in Research Honors program sponsored by a grant from the National Institute of Mental Health, traveled with seven COR scholars to Atlanta, Georgia in November for the national COR conference.

COR Honors Scholars

- Marcel Garcia, Maria Mendez, and Jolene Aki presented research from their summer internships at the University of Maryland, Duke University, and the University of Oregon, respectively.

- Other COR student participants from the Department of Psychology included: Adrian Castillo, Andrea Salazar, Kelvin Alfaro, and Lily Posin. The students attended intensive workshops on cutting edge mental health research, grant writing, and research funding. In addition, they met with head recruiters from top research institutions interested in placing COR scholars in doctoral programs andsummer research internships.

**ENVIRONMENTAL ENTREPRENEURSHIP IN MARINE SCIENCE**

Dr. Fraka Harmens, Department of Earth and Environmental Sciences, is the Principal Investigator on a three year NOAA (National Oceanographic and Atmospheric Administration) grant that supports five graduate students working on their MS in Marine Science as well as a business entrepreneurship certificate.

The NOAA students are in the second year of their graduate work and have completed all of the core science and business curricula.

Two of the students completed their internship requirement this summer by going to sea and participating in the collection and interpretation of multi-beam bathymetric and backscatter data needed in marine benthic habitat mapping.

Holly Lopez is completing her fieldwork for her thesis, which addresses dynamic bedforms such as sand waves as potential foraging habitats. Cassandra Brooks is continuing her thesis studies on identifying habitat types for the Antarctic toothfish. The other three students are now focusing on thesis projects and are working with Dr. Fraka Harmens and Dr. Gary Greene to have their projects identified by this coming summer.

All the students were able to meet Jean-Michel Cousteau, the world famous explorer, environmentalist, educator, and film producer at Fresno State during the opening of Science II. Cousteau is also a successful entrepreneur who has designed an environmentally responsible and culturally appropriate, ocean-oriented resort in the Fiji Islands.

Dr. Harmens and her colleagues recently published a paper entitled “Fostering Entrepreneurship in Female Minority Marine Science Graduate Students” that was also presented at the San Francisco-Silicon Valley Global Entrepreneurship Research Conference in 2005.

**JOINT MATHEMATICS MEETING**

Dr. Doreen De Leon attended the Joint Mathematics Meeting in Atlanta in January. She attended several presentations related to image processing. The presentations discussed recent research in various areas including the removal of motion blurs from an image, image in painting (which involves “filling in” areas with missing information), and decomposition of an image into cartoon (or sketch of the image) and texture. She also attended research presentations of general interest in the area of ecology. The teaching presentations Dr. De Leon attended were mainly aimed at using technology, projects, and modeling in differential equations courses. She also attended presentations by MAA teaching award recipients to gain additional insight into the art of teaching. In addition, Dr. De Leon was one of the judges for the undergraduate student poster session. She also attended the MAA Minicourse on WebWork.

**EARTH SCIENCE WEEK CELEBRATION**

Lecturer, Kerry Workman-Ford invited schools from throughout the Fresno and Clovis Unified School districts to attend an Earth Science Week celebration. In all, over 350 classes from area schools attended, totaling over 300 students from the fourth, fifth and sixth grades. Students toured the hallway exhibits, beginning with the mural, they made fossil casts near the field storage area, and they learned one of the ways that geologists determine the interior structure of Earth.

On Wednesday, October 12, Dr. Robert Christiansen, spoke about the Volcanic Evolution of the Yellowstone Plateau Region. Dr. Christiansen, Research Geologist Emeritus of the U.S. Geological Survey, was the lead geologist for the 1980 Mt. St. Helen’s eruption and the talk was quite successful with 93 people attending, the highest participation ever for one of four talks.

**ADMINISTRATIVE ASSISTANT VENGEI BALLI DESERVES SPECIAL THANKS FOR HELPING ADVERTISE THE TALK, INVITING GROUPS, ARRANGING ACCOMMODATIONS, AND COORDINATING THE CATERING.**
Research in Dr. Paul Crosbie’s lab in the Department of Biology centers on investigations of parasite-host ecology and the evolutionary relationships within a variety of parasite groups, primarily using DNA sequence data. His students are involved in a wide array of different projects, including studies of cougar habitat use in the Sierra Nevada Mountains, parasite prevalence and identity in California water birds, therapeutic approaches to avian botulism, and ant molecular systematics. In recent years a particular focus has been on two protozoan parasites that have been the cause of numerous deaths of the threatened southern sea otter, Enhydra lutris nereis. A variety of collaborative work, primarily with colleagues at the University of California, Davis, the California Department of Fish and Game, and the University of British Columbia, has clearly established that frequent cases of encephalitis in sea otters off the Californian coast have been caused by Sarcocystis neurona and Toxoplasma gondii, two protozoan parasites with primarily terrestrial mammal based life histories. The only known definitive host that sheds oocysts of S. neurona is the opossum, and of T. gondii, cats (including bobcats and pumas). In both parasite’s cases, virtually any other mammal may become infected with either parasite in immature form - the possums and cats subsequently become infected by ingesting these intermediate hosts. Most notably, S. neurona is the cause of a serious disease of horses, Equine protozoal myeloencephalitis (EPM), and T. gondii may cause abortion in cattle and serious congenital neurological damage in humans. Work conducted by Dr. Crosbie’s M.S. student Scott Peat (now pursuing a Ph.D.) clearly showed that multiple isolates of Sarcocystis from sea otters were all S. neurona, based on DNA markers, and all were essentially indistinguishable from terrestrial isolates. The National Science Foundation under its Ecology of Infectious Diseases program has funded Dr. Crosbie and his collaborators, now includes the Institute for Ecosystem Studies in Millbrook, New York, to fully investigate how T. gondii, with only cats capable of shedding oocysts, is entering the coastal marine ecosystem. Two graduate students from Dr. Crosbie’s lab (Maria Wieczorek and Lori Bono) will be specifically investigating the prevalence of T. gondii in terrestrial prey of cats, primarily nocturnal rodents, at one of the two previously determined “hot spots” of otter infection, the greater Morro Bay area in San Luis Obispo County. A parallel study will be conducted by students from UC Davis at the second site of multiple otter deaths, Elkhorn Slough at the edge of Monterey Bay. Rodents will be trapped at multiple sites each season for a period of three years to evaluate what proportions of cats’ prey are infected with T. gondii. Other investigators in the team will be assessing genetic diversity of parasites isolated from these animals, oocyst transport in the coastal environment, the role of terrestrial freshwater runoff in parasite dispersal, oceanographic factors, and sea otter population dynamics. The overall goals of the study are to more fully understand the dynamics of transmission of this debilitating parasite, with the hope that recommendations may be made to potentially diminish otter infection rates. The project also serves to indicate what effects near-shore terrestrial biological pollutants can have on animals that are high on the food chain and that also consume a large amount of food (large otters may eat more than 8 kg daily). Hopefully the results of these studies will provide data that lead to less biological pollution of coastal waters, and long-term changes in how terrestrial water discharge is handled, as well as give us a better understanding of the potential impacts of domestic animals on the environment.

Prominent Social Psychologists Meet this Spring for the Second Yosemite Conference on Social Psychology Aroldo Rodrigues, Robert Levine, Lynette Zedeen and colleagues in the Department of Psychology have organized the 2nd Yosemite Conference of Social Psychology to take place March 20th at the Tenaya Lodge. This is a major endeavor which will have significant national and international impact on the field of social psychology and which will offer an outstanding educational opportunity for our students. The conference follows in the shadows of the successful first Yosemite Conference which took place in 1997 when, on the 100th anniversary of the first experiment in social psychology, the Department of Psychology brought together nine legends of social psychology from around the country to reflect upon the field which they had been so instrumental in creating. Yosemite II brings together a newer generation of equally prominent social psychologists. The theme this time will be “Career Journeys in Social Psychology: Looking Back to Inspire the Future.” Presenters will describe their personal journeys—the important people and events that influenced their paths, the major turning points, the main decisions, and how the lessons they learned along the way can help future social psychologists. In the end, we expect to not only hear the personal histories of these great psychologists but also the diverse paths to success in the discipline itself. The speakers will be: Robert Cialdini (Arizona State University), Edward Diener (University of Illinois), Alice Eagly (Northwestern University), Robert Fath (UCLA), Aroldo Rodrigues (California State University, Fresno), Robert Rosenthal (University of California, Riverside), Shelley Taylor (UCLA), Harry Triandis (University of Illinois), and Bernard Weiner (UCLA). The conference is co-sponsored by the Department of Psychology, the College of Science and Mathematics and the Provost’s office. The first Yosemite Conference resulted in a book (Reflections on 100 Years of Experimental Social Psychology) edited by Rodrigues and Levine (Basic Books, 1999) and a video. A book and video are also planned to emerge from this year’s conference. More information is available at the conference website: http://psy. csufresno.edu/YosemiteConferenceII/

RISE Program
The faculty of the Colleges of Science and Mathematics and Health and Human Services, under the leadership of Dr. Alejandro Calderón-Urrea from the Department of Biology, has been awarded a $1.28 million grant from the National Institutes of Health for the development of a Minority Biomedical Research Support (MBIRS) Research Initiative for Scientific Enhancement (RISE) Program. The purpose of the program is to enhance the research environment at minority-serving institutions. The overall goal is to increase the interest, skills, and competitiveness of students and faculty in pursuit of biomedical research careers. The RISE program at California State University, Fresno provides opportunities for students interested in research, to help them envision their own research career and to provide the tools for achieving this goal. 1) The Pre-Research Activity contains components designed to make biomedical and behavioral research and research careers more visible to lower division students and to give students opportunities to determine if a research career is attractive. 2) The Pathway to Success Activity and the 3) Research Experience Activity are designed to offer a promising group of students interested in pursuing research careers, a career, guidance through the process of preparing for entry into Ph.D. programs and an intense research experience. The Pre-Research Activities are open to all Fresno State students. Many of the activities in the Pathway to Success and the Research Experience Activities are limited to the RISE Scholars, a select cohort of graduate and undergraduate students. Students who are chosen to be RISE scholars are required to sign an individual contract agreeing to participate in research and RISE activities, complete their B.S. (or M.S.) in two years, and apply to at least one Ph.D. program by the end of the two years. Graduate students who are selected as RISE Scholars receive an annual $18,000 fellowship and undergraduate RISE Scholars receive a $10,000 yearly research assistance stipend for two years. Participants also receive a GRE prep course, a graduate school application workshop, technical workshops, and guidance through their research experience. More information about the program can be found at http://www.csufresno.edu/biology/RISE/index.html. Dr. Alejandro Calderón-Urrea, Dr. Alice Wright (Program Director), Dr. Sharon Brown-Weltly (Assessment Coordinator), Dr. Saeed Aata (Undergraduate Coordinator), and Dr. Jim Prince (Graduate Coordinator) are undertaking the development of the program and selecting students for the initial group of RISE Scholars. This first cohort of students began the RISE program in August 2005. New students will join the program each August. Information about applying for the second student cohort is available now.
The College of Science and Mathematics’ Science and Mathematics Education Center offered a very well attended 3 unit Earth Science course this summer from June 20 – July 1, 2005. The institute was entitled “Mission to Earth: Earth Science from the Core to the Edge of the Solar System.” It was held on the Fresno State campus. The course, attended by over 60 Middle and High School Science teachers from throughout the university’s service region, was collaboratively sponsored and funded by the National Science Foundation, the NASA Jet Propulsion Laboratory in Pasadena, and the CSU Office of the Chancellor.

The course provided preservice science teachers with an integrated introduction to the oceans and the atmosphere. It focused on California Science Standards topics in geology, marine geology and geophysics, and physical oceanography.

The program was heavily infused with an array of exciting NASA resources provided by JPL. It addressed the origin and evolution of the ocean basins; sedimentation, global tectonics; ocean currents, waves, and tides; ocean acoustics, gravity and magnetic field measurements and interpretations; the technology used to explore the oceans; and environmental issues and concerns.

Dr. Stephen Lewis, Associate Professor of Earth and Environmental Sciences served as lead instructor and Ms. Jean Pennycook of the Fresno Unified School District served as co-instructor. In addition, the program featured visiting scientists from JPL including Dr. Joy Crisp, Senior Research Scientist on the Mars Rover Expedition; Dr. Jorge Vasquez, an internationally known scientist from JPL, who has worked extensively with remote sensing in oceanographic studies; Dr. Rob Raskin, another internationally known JPL scientist and developer of key remote sensing software (PODAC) widely used today in space science; and Dr. Parvin Kassaie, Program Manager for Educational Programs at JPL.

Dr. Gerard Hanley, Senior Director, Academic Technology Services for California State University, Office of the Chancellor also presented on the Multimedia Education Resource for Online Learning and Teaching (MERLOT). This year, we plan to develop a state of the art online course in earth space sciences in collaboration with the science staff at the Jet Propulsion Laboratory.

B.E.S.T thru T.L.C.S: BRINGING EXCELLENCE TO TULARE THROUGH TEACHING LEARNING COLLABORATIVES - SUMMER PROGRAM

The Science and Mathematics Education Center is a partner (SMEC’s director serves as a Co-P.I. for this project) with Tulare City Schools, Brea Vista, Oak Valley, Palo Verde, Pixley, Tipton and Sundale School Districts; the K-12 Alliance/West Ed, Fresno Metropolitan Museum of Art and Science; Edison Ag-Tac, and Land-O-Lakes/Dairyman’s Association. The project serves 54 teachers and 11,000 students in the greater Tulare area and focuses on improving science teaching and learning in grades 4-8. Several Fresno State and community college partner preservice students will be involved as assistants in the project and Drs. Kern and Katti in the Fresno State Biology Department and Dr. Joe Gandler in the Chemistry Department are helping out as science content experts with the program. An intensive summer science institute was held this past summer and this fall the project continues its important work in development and implementation of outstanding science lessons for the elementary level.

CENTRAL VALLEY MATHEMATICS PROJECT (CVMP)

The Central Valley Math Project is a partnership between the Sanger Unified School District, Kings Canyon Unified School District, California State University Fresno’s Mathematics Department; the Science and Mathematics Education Center and the San Joaquin Valley Math Project.

This past summer, teachers wishing to improve their knowledge of math content and instructional practice were provided a five day intensive program dealing with topics in Algebra and Geometry focusing on the highly acclaimed “Lesson Study” approach. The program targeted 5th grade through 8th grade mathematics teachers as well as Fresno State preservice math teacher undergraduates. The program ran from August 1st through August 5th and was held at the Fresno State Campus. Continuation programs are slated for Sept 10th & 24th, Oct 8th & 22nd, and Nov. 5th. Participants will earn university credit for completion of the program.

The program is directed by Dr. Rajee Amarasinghe of Fresno State and Mr. Jeff Brown of Sanger Unified. The university coordinator for the institute was Mr. Jaime Arvizu, Assistant Director of the Science and Mathematics Education Center.

CSU CENTER OF EXCELLENCE IN SCIENCE, MATHEMATICS, AND TECHNOLOGY EDUCATION

California State University, Fresno has been selected by the Office of the Chancellor as a future site for a Center of Excellence. The Fresno State campus will house the CSU Center of Excellence in Science, Mathematics, and Technology Education under the direction of Dr. David M. Andrews and will be housed in the College of Science and Mathematics. Participants publish abstracts on their research activities in the United States Department of Energy Lab publications. Fresno State has maintained the highest representation in the nation of students attending DOE labs.

PST PROGRAM

The Science and Mathematics Education program sponsored 10 undergraduate/credentialed science and mathematics majors to serve as Research Interns at the United States Department of Energy Labs this past summer. The 10-week internship allows students to work as research assistants with world-class scientists at the labs.

This summer, 9 students (Guadalupe Amezquita, Dinicio Delgado, Meagan Jamieson, Brandi Miller, Chris Taylor, Marlena Gutierrez, Breshelle Farb, Danielle Jorgens, Rodger Bailey) were placed with scientists at the Lawrence Berkeley Labs and one student (David Getman) was placed at the Oak Ridge National Laboratory in Oak Ridge, Tennessee. The program, known as the PreService Teacher (PST) program is funded by the National Science Foundation and the United States Department of Energy. Participants publish abstracts on their research activities in the United States Department of Energy Lab publications.

NOYCE SCHOLARSHIP PROGRAM

SMEC is pleased to announce that it now has 53 science or math majors/single subject credential students enrolled in its Robert C. Noyce Scholarship Program funded by the National Science Foundation. Scholars receive significant scholarship support in turn for their agreeing to work in high need middle or high schools as science or math teachers for up to four years. The program attracts committed students with high grade point averages and strong recommendations. The program will continue to offer scholarships and invites interested applicants.
SMECTEP PROGRAM

The Science and Mathematics Education Center Teacher Education Program (SMECTEP), funded by the National Science Foundation continues to provide a strong recruitment and support program for math and science majors enrolled at our partner community colleges who plan to transfer to Fresno State as part of the Single Subject Science Program of Study (BA in Natural Sciences, any of the science disciplines, or mathematics). To date, a number of students supported by SMECTEP while at one of the community colleges have successfully transferred to Fresno State and have excelled. Many have become Noyce Scholars. SMECTEP also provides special financial and programmatic support for those individuals transitioning from other professions into a career in science or mathematics teaching.

SMECTEP/ETEC BIOPHOTONICS SUMMER PROGRAM

The Science and Mathematics Education Center in collaboration with the Edward Teller Education Center at the Lawrence Livermore National Laboratory presented a 3-day intensive workshop on Biophotonics. Biophotonics is the science of generating and harnessing light (photons) to image, detect and manipulate biological materials. It is used in biology to study molecular mechanisms, function and structure. It is used in medicine to study tissue at the macro and micro level to detect, diagnose and treat disease.

Biophotonics is a fascinating topic which involves many science disciplines including physics, chemistry, biology, mathematics, and engineering, providing an excellent avenue for introducing students to the truly interdisciplinary nature of much of scientific research. It is a critical emerging technology providing an exceptional career path. The workshop was attended by science teachers from throughout the Central Valley. Past SMECTEP/ETEC programs have included topics in Biotechnology, Water, Chemistry, and Environmental Science. We look forward to more exciting

MBA COMPLETED

Dr. Lynnette Zelezny, new chair of the Psychology Department, completed her M.B.A. from the Craig School of Business at California State University, Fresno. Her thesis, “Social Exchange and Executive Mentoring: Analysis of Cost, Benefits, and Control Across Stakeholders” applied social psychological theory to address business practices that indirectly perpetuate dramatic gender disparities in professional leadership. This paper was submitted for presentation at the International Congress of Applied Psychology in Athens, Greece in July 2006. The psychology department has a psychology/MBA option, which allows a student to graduate with both a B.A. in psychology and a M.B.A. in just 5 years.

Social Exchange Theory and Executive Mentoring: Analysis of Cost, Benefits, and Control Across Stakeholders

Final MBA Thesis Submitted for Presentation at the International Congress of Applied Psychology

Athens, Greece, July, 2006

Dr. Zelezny argues that, because of its narrow conceptualization and weak interface with behavioral theories, past research on executive mentoring has been short sighted. In fact, it has failed to contribute to the advancement of pragmatic cost effective mentoring strategies in business and it may have indirectly perpetuated well-documented gender disparities in mentoring that have lead to the continuance of an impermeable glass ceiling for women in executive positions. In this theory-driven paper we debunk the assumption that effective mentoring is primarily dependent on the self-sacrificing actions of mentors, who, supposedly due to altruistic motives, devote time and energy to launch someone else’s career. Our premise is that mentoring is more than a one-sided interaction that benefits one party; it must be re-conceptualized as a symbiotic process among multiple stakeholders, namely organizations, mentors, and protégés. We contend, as posited by social exchange theory, that effective mentoring is best predicted when all stakeholders gain maximal benefits for minimal cost. Considering variables often cited in the literature, a systematic matrix was developed to identify the most balanced social economic mentoring model that optimizes benefits and control for all stakeholders and minimizes costs.

Applying this matrix a comparative analysis of costs and benefits was conducted on traditional models of mentoring: formal vs. informal, hierarchical vs. lateral, and dyads vs. teams. Social economic analyses showed that these traditional mentoring models were imbalanced across stakeholders in terms of cost, benefits, and control; thus, supporting the advancement of a flexible new model of executive mentoring, semi-formal constellation mentoring, which is a semi-formal intracompany approach that merges hierarchical and lateral strategies, and dyadic and team structures to maximize the potential for outcome efficacy at minimal cost for stakeholders.

In this conceptual model it is posited that organizational investment in the support, and quality maintenance of mentor constellations, comprised of peers and supervisors, will also gain effective multilevel cross-training, a highly competent leader, and employee loyalty. Moreover, we predict that implementation of this innovative model will result in social facilitation among team members yielding increased work productivity and morale. Likewise, mentors who share the costs and responsibilities of mentoring with a team, thus reducing individual costs, will gain tangible individual benefits, which may include compensation, organizational recognition, and collegiality. Ideally this strategy would lead to an increase in the pool of mentors and a decrease in mentoring disparities, especially among women, who historically have received far less executive mentoring than men.

Finally, protégés in this model clearly gain from organizational investment that offers both peer mentoring to build skills and supervisor mentoring to guide career advancement along with strengthened psychosocial support. Hence, we predict this cutting-edge model will result in a more constructive organizational culture that exemplifies a norm of responsibility.

WATERSHED MONITORING AND HYDROLOGIC SIMULATION USING GIS

The upper Fresno River in Madera County, California, drains to Hensley Lake which was created for flood control, irrigation, resource management, and recreation. The reservoir has a storage capacity of 90,000 acre-feet and a water surface area of about 1,500 acres.

In recent years, excessive nutrient loading in the watershed led to massive algae blooms in the lake, causing public concerns over continued beneficial uses of Fresno River and Hensley Lake. CSU Fresno faculty and students are leading a study supported by a grant from the U.S. Environmental Protection Agency, administered through the State Water Resources Control Board, to identify nutrient sources impacting the watershed.

To monitor water quantity and quality in Fresno River and Hensley Lake, 24 sampling sites along the main stem and major tributaries of the river, and on the lake were used. Six sampling events were conducted during 2003-04 water year. Past and current land-use patterns, residential and current land-use patterns, residential
are analyzed to determine the sources of nutrient loading. The field monitoring and hydrologic modeling involved a combined use of GIS, GPS and hydrologic simulation programs.

The simulation results were calibrated using the monitored data. The results indicated that: (1) The annual contribution of river water to the lake was significantly decreased after the year 2000 as a result of residential development; (2) The dissolved oxygen in the river was at critical (near minimum) levels for potential beneficial uses (such as swimming and aquatic life); (3) Nutrient concentrations in the watershed were always lower than in the lake during the low flow period, strongly suggesting that the river water is diluting the lake. Large amounts of nutrients may have come from a few large-storm events in the watershed; and (4) High bacteria (total Coliform and E. Coli) numbers prevailed in the middle and downstream reaches of the river, indicating that disease-causing bacteria may be present in the watershed. These results are being used to recommend restoration measures by land managers (county, state, federal) and property owners throughout the drainage area. While this watershed, like many others in the area, will never be restored to its pristine, efforts such as water conservation, land use and waste management, will hopefully help restore the water quality condition to be above the critical levels designed for beneficial uses such as recreation.

**Department of Biology**

Dr. David Andrews Designation (as Executive Director) of a CSU system-wide “Center of Excellence in Science, Mathematics, and Technology Education” to be based at Fresno State. 

Dr. Alejandro Calderón-Urruea 1) Fall 2004 Subbatical leave: Visiting Scientist, Biotechnology Institute, University of Ghent, Ghent, Belgium. 2) Summer 2004. Received an award from The North American Arabidopsis Steering Committee (NAASC) to attend the Fifteenth International Conference on Arabidopsis Research (Arabidopsis XV). Held in Berlin, Germany. 3) Elected to the Research Awards Committee of the Academic Senate (2005-08 term).


Dr. Ruth Kern Outstanding graduate student oral presentation award at the Central California Research Symposium to Karen Sproull working under Dr. Kern’s supervision.

Dr. Mamat Rawat 1) American Society of Microbiology Minority Undergraduate Research Fellowship awarded to Moises de la Torre to perform undergraduate research under Dr. Rawat’s supervision.

**Department of Chemistry**

Chemistry continues to provide an excellent education to the large cohort of chemistry majors. For the first half of the year, the majority of each faculty member’s time is taken up by activities directly related to classroom instruction, advising, and research supervision. This results in the development of close, interactive relationships that foster student learning. During this past year the Master of Science in Forensic Science has received approval by the Academic Senate and by Proposition 51. The program has been submitted to the Chancellor’s Office for final approval. This program will be led by Dr. Sulekha Cotcione and has a projected enrollment of over 500 students. For such a small department, this is an outstanding achievement.

**Department of Computer Science**

Faculty Honors

Dr. Ke Wu Outstanding Faculty Publication Honored at the 8th Annual Faculty Publication Exhibit and Reception, Madden Library, California State University, Fresno, 2005.

Department of Psychology

Dr. Sergio Aguilar-Gaxiola Member of the National Advisory Mental Health Council (NAMHC), National Institute of Mental Health (NIMH) since January, 2004. Elected Chair-Elect of the Board of Directors of the National Mental Health Association (NMAH), on June, 2004. Nominated by the President and Provost at CSUF for the Wang Family Excellence Award, a statewide California State University System award to recognize outstanding faculty and administrators, on Feb. 2005. Member of the Advisory Board for Research and Sponsored Programs (elected as member of the board by the Academic Senate to represent the university faculty) since Feb. 2005.

Dr. Matthew Sharps Provost’s Award for Research and Scholarly Activity

Dr. Marilyn Wilson Provost’s Award for Graduate Teaching and Mentoring

Dr. Lynnette Zelensky Nominee, U.S. Professor of the Year (2005) Carnegie Foundation
STUDENT ACTIVITIES

Awards, Competitions and Fellowships

MOISES DE LA TORRE, BIOLOGY UNDERGRADUATE STUDENT WINS ASM-MURF FELLOWSHIP

Moises de la Torre, an undergraduate student majoring in biology, has been awarded an American Society of Microbiology Minority Research Fellowship (ASM-MURF) to perform research for a period of 10-12 weeks this summer under the supervision of Dr. Mamta Rawat. Only five students were selected for this program nationwide. The ASM-MURF were awarded on the basis of academic achievement, career goals as a research scientist, leadership skills, involvement in activities that serve the needs of underrepresented and historically excluded groups, and previous research experiences.

The ASM-MURF provides a stipend of $3,500, and an additional $1,000 for students to travel to the 2006 ASM General Meeting, which will be held in Orlando, FL, May 21-25, 2006. Moises will conduct a poster presentation of his summer research and may also be selected to do an oral presentation. Moises will also be attending the 2005 Annual Biomedical Research Conference for Minority Students (ABRCMS), which will be held November 2-5, 2005 in Atlanta, GA. An additional benefit of this fellowship is a one-year complimentary membership to ASM.

Moises de la Torre has been conducting research under the supervision of Dr. Mamta Rawat since fall 2004 semester. He presented the results of this research at the Central California Research Symposium in April 2005. He will be continuing his research project on the identification of genes that contribute involved in sensitivity to oxidative stress in Mycobacterium smegmatis this summer.

Summer 2005 Pfizer Research Fellowship Awarded to Fresno State Undergraduate Student in Chemistry

The Global Research and Development Center of the pharmaceutical giant Pfizer, Inc. in La Jolla, CA, has awarded a $5,000 Summer Research Fellowship in Organic Chemistry to Fresno State Chemistry major Felix Perez and his faculty mentor Dr. Seazed Attar. The Program under which this award was given, titled “Academic-Industrial Relations (AIR) Summer Minority Research Fellowship in Organic Chemistry,” is in keeping with Pfizer’s commitment to the cultivation of ethnic diversity in the pharmaceutical sciences workplace. The Program provides motivated and interested undergraduate students from under-represented ethnic groups in Chemistry the opportunity to gain experience and hands-on skills in modern synthetic organic chemistry research.

Sponsored by a faculty mentor, the eligibility requirements for this very competitive fellowship (only five were given throughout California during Summer 2005) include one year of coursework and experience in organic chemistry, a good GPA, and a 2-page proposal for an original research project to be performed during a 12-week summer session at his/her school under the guidance and supervision of that mentor. Of the $5,000 Fellowship, $3,500 goes to the student as a stipend and $1,500 is for research overhead costs.

At the end of the 12-week period, the student and faculty mentor are expected to present their research results at a poster session hosted by Pfizer at their La Jolla center. Felix Perez was born and raised in Fresno. He graduated from Edison High Magnet School for Science and Math in June 2003 and enrolled at Fresno State in the Fall. Felix is pursuing a BS degree in Chemistry with a minor in Math. He has been very successful in both areas as evident from his perfect 4.0 GPA! He was a student in Dr. Attar’s Organic Chemistry lecture and lab during the 2004-2005 academic year and that is how he found out about the Pfizer Fellowship opportunity. He has been working on his proposed project (titled “Catalytic Transfer Deuteration”) in Dr. Attar’s research laboratory since the beginning of June and will be traveling to La Jolla on August 12th in order to present his results at the Pfizer site. Felix, who plans to continue his research with Dr. Attar during the 2005-06 academic year, expects to complete his BS degree by May, 2007.

Encouraged by his success in synthetic organic research this summer, he plans to continue his education in order to obtain a Ph.D. degree in organic chemistry.

Professionally, Felix has not yet decided whether he wants to perform synthetic research in an industrial setting (such as that at Pfizer) or to become a university professor. However, Dr. Attar is confident that Felix will be a very successful professional regardless of his future career path.

TODD JOHNSON, BIOLOGY UNDERGRADUATE STUDENT RECEIVES HOWELL-CSUPERB

Todd Johnson has received the Doris Howell/California State University Program for education and research in biotechnology (CSUPERB) award for his research on the role of ergothioneine in mycobacteria. Ergothioneine is a ubiquitous thiol that is found in almost all organisms but is synthesized only in fungi and a genus of bacteria called Mycobacteria. The exact function of this thiol is not known but it is thought to serve protective, antioxidant functions in humans. Todd Johnson, under the guidance of Dr. Mamta Rawat, his faculty mentor, will determine the levels of ergothioneine in Mycobacterium smegmatis, a non-pathogenic mycobacterium, and other related bacteria under various growth conditions. Data generated from this project may indicate whether ergothioneine also protects Mycobacterium from oxidants. Since important pathogenic such as Mycobacterium tuberculosis, the bacterium responsible for the disease tuberculosis and Mycobacterium leprae, the bacterium responsible for the disease leprosy are members of the genus, Mycobacteria, this research may eventually lead to novel drug targets.

The Howell-CSUPERB award is a result of a long-term joint venture between CSUPERB and the Doris A. Howell Foundation for Women’s Health Research. The Doris A. Howell-CSUPERB award funds faculty-mentored undergraduate student research projects on biotechnological, biological, biochemical, and medical issues related to women’s health. This year, ten awards were distributed to California State University undergraduate students of which Todd Johnson was the sole awarder from our campus. In the past, other biology undergraduate students have received this honor. Previous Doris Howell/CSUPERB awardes include Brian J. Kosak and Sonia Mayoral (mentored by Dr. A. H. Calderon), and Michelle Davison (mentored by Dr. Wright).

Bulldogs Defeat Trojans – In Brainy Competition

In what fans hope will be a precursor of Saturday’s big football matchup, Fresno State beat USC in one of the rounds of the annual College Bowl “Tournament” last weekend.

Fresno State College Bowl team members Laura Gaffery, Chris Marklund and Lily Pesin College of Science and Mathematics students) topped the University of Southern California team 170-145. Other schools competing in the double round-robin format were UCLA, Berkeley, Michigan and Arizona State.

“Given the upcoming football game at USC, we are very proud of our team and are hoping our football team will see a victory as well,” said Gaffery.

The Trash Tournament focuses on pop culture. College Bowl, the “Varsity Sport of the Mind,” is a competitive trivia game. Questions range from topics as diverse as chemistry, pop culture, sports, literature, history and politics. The format of the game is such that both an individual’s knowledge and the group’s collective knowledge are tested. Bonus questions, which allow team conference, come from a variety of subjects and are more specific than the individually answered toss-up questions.

Gaffery said College Bowl and Fresno State’s sponsoring club “The Brain Trust” recognize the diversity of disciplines that are offered at Fresno State and realize that each person’s individual strengths contribute to the strength of a team, not any one individual.

On Saturday, Dec. 3, Fresno State will host its annual Intramural Tournament. The tournament is free to all students, faculty and staff. The Brain Trust holds regular meetings Sunday nights at 7 p.m. in University Student Union, room 314.

For more information on the Brain Trust or the intramural tournament contact Chris Marklund at fresnostatecollegebowl@yahoo.com.
was first exposed to science at an elementary school.

The Graduate Dean's Medalist, Tonya Atkins, was first exposed to science at an elementary science fair where she demonstrated that a lemon could be used to power a light bulb. She received an honorable mention and knew that she wanted to be a scientist. However, being the first generation in her family to pursue a college education did not come easy, and she did not reach her goal until she realized that she was not pursuing her dream.

At 32 Tonya Atkins was chosen as the College of Science and Mathematics Graduate Dean’s Medalist. She completed her M.S. in Chemistry in May 2005 with a 3.75 GPA and will be continuing her Ph.D. program at the University of California, Davis.

Her research accomplishments are substantial. Ms. Atkins has been awarded the Chan Scholarship, Chan research Award, McNair Scholarship, Robert and Norma Craig Fellowship, and the Outstanding Research Presentation Award for the Ronald McNair post-baccalaureate achievement program symposium.

Ms. Atkins is equally accomplished in her teaching endeavors on our campus. She has worked both as a Teaching Assistant and a Research Assistant. Her colleagues in Chemistry describe her as outstanding, creative scholar and researcher in Chemistry.

**MEDALIST’S AWARDS**

**Graduate Dean’s Medalist**

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**President’s Medalist**

Nazia Khan was chosen as the College of Science and Mathematics President’s Medalist. Ms. Khan is a psychology major and has maintained a 4.0 GPA during her undergraduate career. Her professional achievements are stunning. This includes the President’s scholar in the Smittcamp Honors program, NIH COR, Career Opportunities in Research Program, and honored twice the College of Science and Mathematics with faculty sponsored student research awards. She has received the Pickford Memorial Scholarship and the Milton Linder Memorial Scholarship.

Ms. Khan was the Student Affairs Senator for Associated Students, student representative on the committee for the Protection of Human subjects, student member of the Smittcamp Applications Review Committee, member of the Advisory Board for Central Valley Cultural Heritage institute, active in organizing the National Depression and Anxiety Screening Day, Vice President of the Muslim Student Association, President of Psi Chi, and the National Honors Society in Psychology.

Ms. Khan will be continuing her educational goals in Clinical Psychology.

**F. Harold Downing Scholarship Recipients**

The F. Harold Downing Scholarship is a $2,000 scholarship that is awarded to an entering senior undergraduate student in each department of the College of Science and Mathematics. The following students have received the 2005 F. Harold Downing Scholarship award.

Thihan Padukkadivana, Biology
Mark Sorenson, Chemistry
Dexter Dale Sullivan, Earth & Environmental Science
Chrisy Steiber, Mathematics
Jarvis Jensen, Physics
Taylor Harris, Psychology

**College of Science and Mathematics Scholarships Recipients**

The following scholarships were awarded for the 2005/06 academic year.

**Andrew Maxwell Scholarship**

Todd Johnson
Khuyen Le

**Thihan Padukkadivana**

Dora Rendulic, biology

**Clay Science Education Scholarship**

Nancy Ferraro
Garrett Smithers

**Nevadah Hollister Scholarship**

Chris Collins

**Milton J. Linder Memorial Scholarship**

Nhu Thy Can
Jasaprem Singh
Antonina Tofan
Kevin Webster

**SCOP Scholarship**

Michael Champion
Isaac Padia
Jennifer Story
Christa Verdegal

The Outstanding Thesis Award for the College of Science and Mathematics went to Matt Ashworth.

**Student Research**

Dr. Steven Blumenshine, Department of Biology is conducting research in Nevada headwater streams, secondary production and biomass of aquatic insects in the San Joaquin Valley, and relating water quality to storage with graduate students, Nicholas Basile, Richard Moss and Zachary Hoover.

Nicholas Basile California State University, Fresno MS Student

**Distribution of Brook Trout and Food Sources in Meadow vs. Wooded Areas of Sierra Nevada Headwater Streams**

Abstract: Stocked Eastern Brook Trout are now well established in historically fishless small headwater streams in the Sierra Nevada. Although non-native, brook trout have maintained healthy populations since stocking ended 60-80 years ago.

Our primary research question was whether brook trout distribution and feeding ecology is influenced by variation in headwater stream habitats and food sources. Stream habitat characteristics and trout demographic data were collected during June and August 2004 from four forested and three meadow sites among five tributaries to Bull Creek in the Sierra Nevada. Both mean fish mass and total fish biomass were greater in forested versus meadow reaches. Macroinvertebrate drift rate did not differ between meadow versus wooded reaches, but was greater in June. However, despite higher fish biomass, trout in forests apparently selected prey from drift whereas trout in meadows were non-selective drift feeders. We are currently using data from Bull Creek to test the generality of trout production models created by other researchers. We are also beginning a genetic analysis of fish tissue from each research site to see if there are distinct trout populations between sites that are separated by natural barriers. The results of this research will be used in a larger, collaborative, whole-ecosystem study conducted by the USDA-Forest Service addressing how current forest management practices affect stream.
This implies that Hensley is likely from corn fields indicate that flooding depth was correlated (r = 0.95) with both die temperature fluctuation and emergence rate. To directly test the temperature fluctuation – production relationship Chironomus dilutus larvae were grown in environmental chambers, under two thermal treatments with the same mean but different daily amplitudes (high: 15°C, low: 6°C) to investigate thermal fluctuation effects on survival and biomass. Larval survival (4x) and biomass (2x) were significantly greater in the low versus high temperature fluctuation treatment. This research has the potential to affect agricultural management throughout the 12,600 km² region, increase aquatic insect production and aid in the recovery of declining bird populations.

**Abstract:** In recent years, many Central Valley reservoirs have experienced losses in total water storage due to evaporation and water releases exceeding supply. Unfortunately, reduced storage may lead to poor water quality. To test this relationship, annual and seasonal reservoir storage was compared to the Carlson Index, which uses variables such as water clarity, phytoplankton abundance, or available nutrient concentrations. This index ranges from 0 to 100, where low values are desirable and relate to good water quality. Three Central Valley reservoirs (Hensley, Eastman, and Pine Flat) were sampled seasonally beginning in Fall 2003. Hensley and Eastman reservoirs had Carlson Index scores indicative of a low water quality (64 and 50 respectively). Pine Flat had a moderate value of 43, suggesting relatively good quality. Index values of 30 or less are desirable. These reservoirs experience the lowest annual storage values during the summer months when water quality is likely impaired. To determine if this was true, summer index values were compared to summer storage volumes for corresponding sampling dates. Index scores for Hensley, Eastman, and Pine Flat were 68.9, 68.8, and 58.8 respectively, and were the highest of any season. These high index scores agree with a relationship between low water volume and decreased water quality. The seasonal scores were regressed against storage. Hensley values produced the most significant relationship (r² = 0.9185) while Eastman and Pine Flat trendlines suggested a less dependent relationship (r² = 0.4214 and 0.4585). This implies that Hensley is likely to have consistent water quality problems due to low variation between parameters. However, reservoir conditions may improve due to above average precipitation in 2005. This extreme wet year has followed four consecutive drought years and is ideal for testing general relationships between water storage and quality.

**Earth and Environmental Science Student Research**

1) Nitin Vaid and Rohit Sharma are undertaking a study of the ancestral Cascade Volcanic arc in the central Sierra Nevada.
2) Matt Wielicki is undertaking a study of the sources of chert use by native American groups that populated the Sierra Nevada foothills.
3) Dale Sullivan and Anne Marie Cooke are undertaking a study of the Guadalupe Complex.

**Project descriptions are as follows:**

1) Origin and evolution of ancestral Cascade arc volcanism in the central Sierra Nevada (just north of Yosemite National Park). Our goal is to come to a better understanding of the links between magmatism and tectonics, in particular how volcanic activity may have been affected by the origin and development of the Sun Andreas Fault.
2) Sourcing of Cherts (With Also, John Pryor and Roger Lafuente from Anthropology). We are attempting to discover the sources of chert artifacts used by native Americans populating the Sierran foothills. Chert was a frequently used materials for arrowheads and other cutting tools, but unlike obsidian, no one has yet conducted a geochemical study to determine the geological sources of chert. Understanding sources of such materials is important because it gives very important information about trade routes and potential reasons for migrations from one region to another (as new supplies are discovered or as old supplies are consumed).
3) Guadalupe Complex: Goals are to examine the origin of Sierra Nevada plutons, by conducting a geochemical study of the Guadalupe Complex, near Mariposa. The Guadalupe Complex offers a rare glimpse into the deepest parts of a granitic pluton, which may hold the secrets to how granitic bodies form. These deep-seated exposures allow us to see processes that occur at much higher temperatures than what can be seen in much of the Sierra Nevada, and will help resolve a debate about whether the Sierra Nevada consists of recycled crust, or represents new growth of the North American continent.

**Psychology Student Research**

Kevin Webster, Ashley Jensen and Zhanna Bagdasarav performed research work in the Fresno Language Behavior Laboratory, supervised by Dr. Lorin Lachs. The research work centers on involving students in psychophysical research concerning the role that visual information plays in communication. For deaf and normal-hearing individuals alike, the additional information provided by reading lips aids in the perception of acoustic information about speech. However, it is not clear how the anatomically distinct neurological subsystems that support visual and auditory perception combine to integrate optical and acoustic patterns, yielding the functional benefit of better speech intelligibility. We have explored this question by investigating the neurobiological integration of auditory and visual information about speech and by investigating the role that visual information plays in the perceptual learning of speech. These projects are all designed to be excellent vehicles for actively involving students in research, from simple data analyses and measurement to the generation of research hypotheses. Projects completed in the last few years have resulted in conference presentations, awards, and honors for undergraduate and graduate students who have advanced our scientific understanding of these important issues.

**New Programs Biotechnology Master’s**

The Biotechnology Program at California State University, Fresno has leapfrogged in the Fall semester of 2005 by offering a new Professional Science Master’s Degree (PSM), which builds on the excellence introduced with the Certificate of Advanced Study in 1988. The Master’s degree encompasses a unique educational program that develops expertise with advanced scientific skills, business practices, and management principles, plus applicable experience at Biotechnology work sites. California State University, Fresno has established and is continuing to establish, new corporate partnerships to engage these students in addressing regional needs where biotechnology/business proficiency can play an important role. As Biotechnology continues to emerge as one of the fastest growing industries in California and nationally, these PSM graduates will be competitively prepared to assist in its expansion.

We are accepting applications for Fall, 2006. For an in-depth view, prerequisites and course of study for either the Biotechnology Professional Master’s Degree or the Certificate of Advanced Study in Biotechnology, contact Dr. Alice Wright or Tamra Bane of the Biology Department at 559-278-2585 or visit our web site at www.csufresno.edu/biology.
Our Supporters

The College of Science and Mathematics gratefully acknowledges the following friends who have provided support for scholarships, teaching grants, and other academic activities in the college. Donors to our college help provide the highest margin of excellence that keeps the college at the forefront in science education.

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Mr. Douglas Joseph Alexander
Mr. and Mrs. Leland Atkins
Dr. Saeed Attar
Mr. Simon R. Avakian
Kent Azaren, MD
Mr. and Mrs. Steven D. Bassi
Dr. and Mrs. Christopher Bencomo
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Mr. and Mrs. Michael Ray Boyer
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Ms. Evangelina Reyes Nunez
Ms. Ellen Ruth Norris
Mr. William L. Noblitt
Mr. and Mrs. Kin Chiu Ng
Mr. and Mrs. Donald Negi
Mr. Wayne Arthur Nan
Mr. and Mrs. Bruce Myers
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The Earth and Environmental Sciences Bench illustrate's geological processes, incorporating plate tectonics, geologic specimens and fossils. Investigate the large stone sphere in the center of the area. Upon closer inspection, the tectonic plates and earth’s continents are visible. A small punch on the sphere spins the earth on its fountain base.

Dr. Margaret Eakin and Dr. Madge Peirsol are seated next to each other in this 1929 photo of Stanford Medical School’s graduating class. They are in the second row to the bottom on the left hand side. Starting from these early years, the women shared their lives and made rich careers in the medical field.

Dr. Eakin was a prominent Fresno pediatrician for years and served as Medical Director of Crippled Children Services, President of the medical staff of Valley Children’s Hospital, Chief of the Fresno Community Hospital, and served as staff at Valley Medical and St Agnes Medical Centers. She passed away in 1979.

Dr. Peirsol, on the other hand lived to be 104 years old. She came to Fresno following the path made by Dr. Eakin and practiced general medicine with an emphasis on obstetrics. The pair shared an office in town. After her first retirement, Dr. Peirsol later became the women’s physician at California State University, Fresno.

The legacy created by these women lives on in the form of a newly created scholarship bearing their names. The Peirsol-Eakin Scholarship will be awarded for the first time in the Spring of 2006. A $1000 scholarship will go to a hard working, pre-medical student in the College of Science and Mathematics. Administrators for the Peirsol-Eakin trust fund hope to encourage promising young college students reach their goal of becoming physicians.

The College of Science and Mathematics is launching an exciting new project to enhance the area surrounding Science II, the Downing Planetarium and the Downing Planetarium Museum. Working with a design firm, a college-wide team has fully developed the concepts behind seven science benches that will be places to rest, learn, contemplate, and marvel at the wonder in our world.

As you can see from the sketches, each department in the college is represented by a thematic bench depicting concepts unique to their field of inquiry. These are:

The Biology Bench demonstrates the evolution, common ancestry and diversity of life on Earth through the depiction of prominent organisms in size relative to their identified number of species, arrayed on a simplified tree of life.

The Chemistry Bench celebrates the elements of life, carbon, nitrogen, oxygen and hydrogen, that account for 99% of all living matter.

The Computer Science Bench demonstrates the ways in which we have integrated computing into our daily lives.

The Earth and Environmental Sciences Bench illustrate’s geological processes, incorporating plate tectonics, geologic specimens and fossils. Investigate the large stone sphere in the center of the area. Upon closer inspection, the tectonic plates and earth’s continents are visible. A small punch on the sphere spins the earth on its fountain base.

The Mathematics Bench introduces two ancient mathematical discoveries, and gives a visual representation of the famous Pythagorean Theorem ($A^2+B^2=C^2$).

The Physics Bench shows a main concept of the Big Bang Theory and our recent paradigm shift in understanding the origin of the universe.

An infant portrait of the universe. If our eyes could detect waves in microwave frequencies, we would see the sky as a patchwork of warm and cold - the primordial light from the beginning of the universe. High resolution data from the WMAP space probe gives an actual picture of this primordial light represented in red and blue.

A reflection of the blue sky above is the veil curtain to peer through and see the workings of the universe underneath. A metaphor for the primordial light hidden from our senses, but when measured with our instruments unlocks the clues to the origin of the cosmos. At night, illuminated at the perimeter, to superimpose the primordial light onto the field of stars above. Stick a toe in or wade through the ancient light to the other side, the curtain of water is only ankle deep.

The Psychology Bench illustrates the psychology of learning, merging the historical influence of Ivan Pavlov with current research on the brain and neuron.

If you would like to be a part of this exciting and visionary project, please contact Roxanne Hinds, CSM Development Director, at 559-278-8597 for information on contributing to one or more of these educational benches.
SAVE THE DATE
ALUMNI RECEPTION
APRIL 21-23

Dear Alumni,

The College of Science and Mathematics cordially invites you to attend our first ever Alumni Reunion. Mark your calendars for April 21-23, and join us for a festive weekend of reuniting with former classmates and professors, attending dinners, receptions, participating in field trips and tours. Our Alumni Reunion coincides with our annual campus Vintage Days event that will offer you three days of music, food and crafts.

We invite you to visit the alumni website to register for this event at www.fresnostatealumni.com where you will find a link to the registration page. All future updates and news about the Alumni Reunion will be placed on the College of Science and Mathematics website at www.csufresno.edu/csm. This website will also have a link to the Alumni web page where registration for the reunion will take place.

In the very near future we will be sending out additional details regarding the reunion by e-mail. If you will be attending the reunion, please register at the Alumni website www.fresnostatealumni.com and click on the link or complete the form below and return it by mail. You may e-mail your information to rhinds@csufresno.edu.

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College of Science and Mathematics
Thea Beddingfield
Office of the Dean
2576 E. San Ramon Ave. M/S ST 90
Fresno, CA 93740-8034

E-mail responses to:
Roxanne Hinds - rhinds@csufresno.edu

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Name: _________________________________________________________________
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Attending reception hosted by Dean on Friday evening, April 21? Yes ____ # of people____ No____

Attending dinner on Saturday evening , April 22?  ($25.00 per person)
Yes _____ # of people_____ Check amount enclosed $________
No ________, I will not be able to attends the dinner on Saturday evening.

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I would like to help the College of Science and Mathematics continue its efforts to offer high-quality education in the areas of Biology, Chemistry, Computer Science, Earth and Environmental Sciences, Mathematics, Physics and Psychology.

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☐ Please send me more information about including the College of Science & Mathematics in my will!
☐ I am interested in becoming part of a CSM Alumni Chapter!

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