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fall 02/winter 03

STATE OF THE COLLEGE

NEW DEVELOPMENTS AND NEW FACES

By Sheldon Axler, Dean,
College of Science & Engineering

Our biggest College-wide event during the Fall 2002 semester was the **Science and Engineering Career Fair**, which was held on November 19. About six hundred of our students showed up to talk with thirty companies and government organizations that set up displays to attract potential employees. Many of the employers told me that they already had wonderful employees who graduated from our College. All of the employers told me how positively impressed they were by the SFSU students they were meeting.

Our big College-wide event during the Spring 2003 semester will be our annual **Student Project Showcase and Alumni Reception**. Please put this on your calendar for May 6, 2003; see page 3 for an invitation. Our Student Project Showcase and Alumni Reception allows you to see the terrific projects pursued by our students and to hear about an exciting area of research from one of our faculty members, while mingling with current faculty and your fellow alumni. By the way, Lannie Nguyen-Tang, who among her many duties organizes our Student Project Showcase and Alumni Reception and produces this newsletter, has a new title: Coordinator of Alumni Relations and Student Projects.

Despite the economic difficulties of California, this year we are searching for fourteen new faculty in the College to start work at SFSU in Fall 2003. Our students deserve the best, so I have asked Hiring Committees and Chairs to recommend only outstanding teachers and

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A New Associate Dean: Sung Hu

Dr. Sung Hu, in his second year as associate dean, considers himself as a very lucky man. “Someone above likes me,” he says and that someone has guided him in all major decisions throughout his lifetime. Dr. Hu came to the United States at age 18 to study electrical engineering. What he found was that, beyond getting a good education, he liked the dynamic, open, free and friendly society even more. Not knowing a single person when he first arrived in this country and speaking minimal English, Dr. Hu put himself through the undergraduate program at Cal Poly, San Luis Obispo, and then headed to Oregon State University for graduate studies. During his second year in graduate school at Oregon State, Dr. Hu debated whether to continue for a Ph.D. or go to work at IBM after completing his M.S. degree. When a new professor from Stanford Research Institute arrived that year, Dr. Hu was immediately impressed with his teaching style and research accomplishments. He became Dr. Short’s first Ph.D. student.

Ever since his childhood years, Dr. Hu had always helped his classmates with their schoolwork, especially in math and science subjects. At Cal Poly, he helped many in his dorm with math problems and had a reputation of being able to solve strange and difficult problems. As a teaching assistant at Oregon State, students loved his teaching. One semester, at the request of students, he taught an extra section without pay. Dr. Hu enjoyed teaching so much that he applied only for teaching positions after he received his Ph.D. degree. “The biggest reward in teaching is seeing students learn. It is so exciting and energizing to participate in and watch student succeed,” he added. “I don’t see many movies, but the ones that I enjoy the most are stories about overcoming great hardship– movies such as ‘A Beautiful Mind.’”

After receiving his Ph.D., Dr. Hu accepted an assistant professor position at Cleveland State University in Ohio. It was during those early years at Cleveland State that the microprocessor came into existence. First, there was a 4-bit microprocessor, essentially used for calculators. Soon came the 8-bit ones. Although not many people saw it at the time, Dr. Hu was intrigued by the potential of these tiny devices. He and a student spent a summer building a computer using the Intel 8008 processor– there were no commercial microcomputers at the time. Dr. Hu then used that machine and started teaching a microprocessor course, possibly one of the first such courses in the country. Subsequently, microprocessors became his major profes-

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College of Science and Engineering Science Teaching Partnership with the San Francisco Unified School District.

by Dr. John Stubbs
Department of Biology

Student in Physics class at International Studies Academy High School preparing for the great egg drop challenge-drop an egg two stories and hit a target without breaking egg.

The National Science Foundation (NSF) has awarded a Graduate K-12 Grant to San Francisco State University and the San Francisco Unified School district. The project award is for three years at $500,000 per year. As of January, 2003, the project will have completed three semesters of outreach to San Francisco public schools. John Stubbs, Professor of Biology, is the Principal Investigator and prepared the grant proposal in 2001, working in close collaboration with the Science Curriculum leadership from the SFUSD. This project is one of 79 nation wide Graduate K-12 awards out of some 400 applications. G K-12 is the acronym given to a competitive grant program initiated based on the philosophy of the Director of the NSF, Dr. Rita Colwell, that there is a national need to set up Public School District partnerships with Universities where science graduate students would work as science collaborators with partner science teachers on-site.

The SFSU / SFUSD partnership provides financial support to twelve COSE graduate students in Master's degree programs per semester. These Graduate Teaching Fellows (GTF) become partners with participating science Teachers in San Francisco Middle Schools and High Schools that have student populations identified by SFUSD criteria as having a high percent of educationally disadvantaged students. Our G K-12 project is focused on 6th through 12th grade. This year our participating schools are Everett and Horace Mann Middle Schools and Burton, International Studies Academy, John O'Connell, and Thurgood Marshall High Schools. The GTF are at the schools for 10 hours/week with 14 Partner teachers and over 900 public school students. GTF and Partner teachers work together to develop and implement hands-on exercises, laboratory investigations, and a variety of activities to promote student understanding of core curriculum concepts and the SFUSD adopted California State science standards. The GTF are not selected on the basis of them planning to become middle or high school teachers. One of the national objectives of the G K-12 is to engage GTF, who plan to go on to University or other research based professional careers, in what the realistic challenges and successes of public school teaching are, to demonstrate the important role they can serve in outreach to science education in the public schools, and to develop a commitment to be continually involved in such outreach throughout their professional careers.

Marine science teacher and class from Thurgood Marshall High School doing a transect population density count of sand crabs at Linda Mar beach.

GTF share their subject area expertise with teachers and students, prepare specific instructional activities at the teachers' request, train students and teachers in computer use in the classroom, become a second pair of hands during lab activities, and make presentations at age appropriate levels on the significance of the research that the GTF are doing at SFSU. The role of the GTF is one of a professional on-site collaborative partner; it is not the role of a student teacher or a teaching assistant. GTF also attend a two hour per week seminar at SFSU during the academic year to hear presentations of strategies for inquiry based teaching and learning pedagogies and to share successes and challenges from their schools. Professors John Stubbs (Biology), Ray Trautman (Chemistry) and Kathleen O'Sullivan (Secondary Education) from SFSU, and Dacotah Swett, Science Curriculum Instructional Specialist and SFUSD project coordinator, form the leadership team that facilitates this seminar In the 1st three semesters of the project we have developed a number of student interactive activities for grades 6 through 12. To view examples, visit our Web site at **www.sfsu.edu/~gk12sf/** and click on the interactive activities heading. One of our Marine Biology GTF is working with her Partner Teacher to develop a two semester 10-11th grade elective Marine Science curriculum at Thurgood Marshall. The 1st photo here is a snapshot of this class on a Pacific beach ecology field trip. The 2nd photo shows a Physics student at International Studies Academy testing her design in the "Great Egg Drop Challenge".

Once a year, we send a team to represent the SFSU / SFUSD G K-12 at a national meeting in Washington hosted by NSF. A highlight this year was the keynote address by NSF Director, Dr. Colwell, who reported that Congress has approved continuing NSF funding to allow current projects to make competitive applications for a second three years of funding, contingent on projects being able to show initiation of sustainable support from the University and the private sector for institutionalization of University/ School District science partnerships. We would welcome any ideas or contributions that might help in this regard as we prepare to submit the SFSU reapplication for a second 3 year term. Contact John Stubbs at e-mail: stujod.sfsu.edu or at phone (415) 338-1753 for further details.

The College of Science & Engineering

cordially invites you and your guests to the

5TH ANNUAL

STUDENT PROJECT SHOWCASE & ALUMNI RECEPTION

Free Admission

Tuesday, May 6th, 2003
Science Building, Room 201
6:00 – 7:30 p.m.

The event features a variety of exciting student projects on display, highlighting our faculty,s commitment to providing SFSU students with hands-on experience in the discovery of new knowledge.

During the showcase, students are competing for many monetary prizes. (Drs. Kenneth and Pamela Fong have graciously sponsored $1,000 in prizes yearly. We still need more sponsors to increase the number of prizes for the students. Let us know if you can help!)

Activities of the evening:

- Meet the students involved in exciting research fields!
- Catch up on news from classmates!
- Enjoy delicious hors d'oeuvres!
- Get reacquainted with former professors!
- Listen to an interesting faculty presentation!
- Win fabulous door prizes!

RSVP today!
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(We'll give you a friendly reminder in May)

For more information, please visit our Web site at:
http://www.sfsu.edu/~science

Please mark your calendar and RSVP to Lannie Nguyen-Tang.

LAB NOTES

YOSEMITE CHANNEL WETLAND RESTORATION FEASIBILITY STUDY

BILL MARTIN
ROMBERG TIBURON CENTER

The Romberg Tiburon Center is a field campus for environmental research and education of San Francisco State University. Since 1982, the Center's Laboratory for Estuarine and Wetland Science has assisted state agencies in a variety of studies aimed at improving and expanding the State's wetland resources. These services include wetland delineation and assessment studies, training in wetland science, biological assessments and field studies, conceptual wetland enhancement plans, and long-term monitoring studies.

In the early spring of 2002, the Laboratory for Wetlands and Estuarine Science completed a Feasibility Study for Restoration of the Yosemite Channel wetland habitat at the Candlestick Point State Recreation Area. This site is located between Hunter's Point (a past naval shipyard) and the San Francisco/San Mateo County line. The entire area was historically part of the tidal marshes and mudflats of San Francisco Bay. Fill material, utilities, and buildings now occupy this area with only the remnant channel itself remaining tidally influenced.

Dr. Michael Josselyn, Professor Emeritus and Senior Research Scientist at the Wetlands and Estuarine Science Lab, directed the study. The goal of the study was to determine the feasibility of restoring tidal and wetland areas of this 34-acre highly degraded site. Principal to the feasibility study was the potential of the site to support Special Status Species and the ecosystem landscape, costs considerations, and maintaining a self-sustaining system over the long-term. In addition, provision for public access, public education, and improvement of public health (through management of contaminated soils and water quality) are important project goals.

Based on input from State Parks staff and interested parties, three alternatives were developed to explore various wetland restoration potentials. The alternatives involved the creation of seasonal wetlands, tidal wetlands, nesting habitats, and transitional habitat zones. During the study, a series of investigations were conducted:

- Appraisal of soil and groundwater for possible toxicity
- Location and placement of fill historic materials
- Potential to removal fill material
- Presence of underground utilities crossing the site
- Affect of the City's sanitary/storm water discharge into the Channel on the biota
- Assessment of the present condition of local biota (vegetation and wildlife)
- Local and ecosystem habitat priority needs
- Review of geological and hydrological data
- Evaluation of the local and environmental communities' wishes.

Figure 1. 1896 USGS topographical map of Yosemite Creek

Upon review of the investigations, the general nature of the initial alternatives was determined to be feasible. With this determination three specific alternatives were refined and are described below.

Alternative A
Seasonal/Brackish water ponds

This alternative creates three shallow-water seasonal pond areas (two to the north of Yosemite Channel and one to the south). This habitat type, which was fairly extensive along the bay margins before development of the San Francisco peninsula began in the 1850's, is now extremely rare. Restoration of this type of habitat would provide important habitat for migratory and resident waterfowl, and shore birds. This alternative would not enhance the existing tidal marsh or habitat for estuarine fish but would require the least amount of excavation of existing fill.

Alternative B
Mixed tidal wetlands and seasonal ponds

Historically, the City of San Francisco occupied a peninsula, which had numerous embayments consisting of mudflats, tidal marshes, brackish and seasonal ponds, and sand dunes. This alternative proposes to construct a seasonal pond, increase the tidal wetlands, and provide increased wetlands along the northern entrance to the Canal. A seasonal pond of some 1.7 acres, increased tidal wetland of 3.7 acres, and removal of a toxic 'hot spot' in the southeastern quadrant to create additional tidal wetland habitat bringing the total wetland acreage to approximately 19.5 acres. The tidal wetland areas are also graded to an elevation to provide for mudflats, cordgrass, pickleweed habitat, and transitional and upland areas. This alternative creates additional habitat for estuarine fish and

invertebrate species, but would require extensive long-term maintenance.

Alternative C
Tidal salt marsh with isolated Nesting Island

Along the shore and margins of San Francisco Bay were once thousands of acres of tidally influenced marshes. Today less than ten percent of the historic salt marsh acreage remains within the boundaries of San Francisco Bay. Alternative C proposes to excavate to the limits imposed by the existing utilities, as much area as practicable along the northern boundary of Yosemite Channel, with the least intrusion of existing channel habitat areas as possible. On the southeastern side of the canal excavation would create a wide tidal channel and isolated nesting island. The transitional area and buffer zones would create refugia habitat during high tides, roosting for raptors, and potential habitat for the San Francisco salt marsh harvest mouse and the California Seablite plant. The alternative is the most expensive in terms of construction costs but would require less maintenance costs than other alternatives.

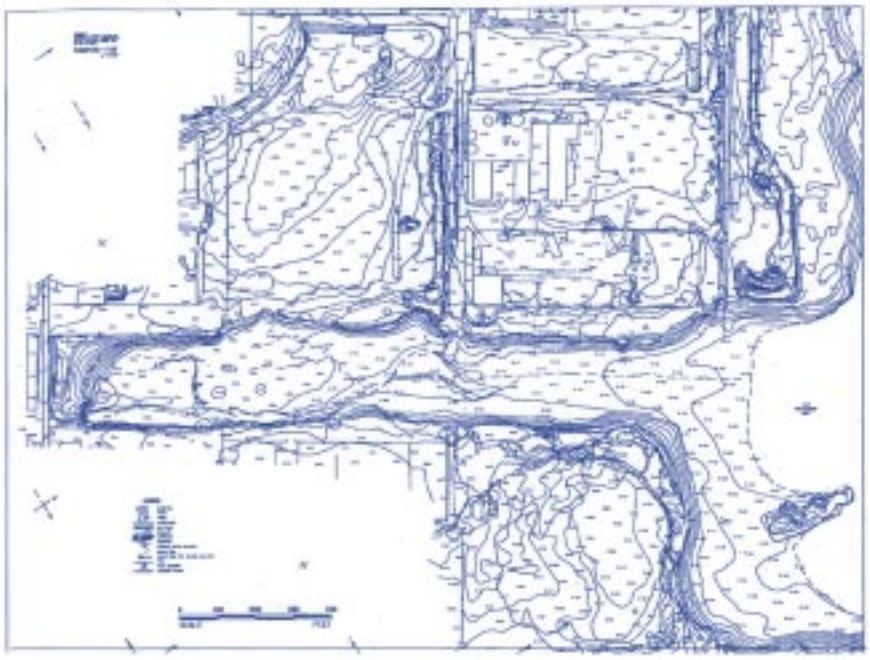


Figure 2. 1998 Topography and bathymetry of Yosemite Channel

Elements common to all three alternatives area as follows:

- Perimeter fencing of the site to control feral animals and unauthorized access
- Development of public access trails with interpretive signage to connect with the proposed Bay Trail system
- Development of a “passive” public recreation area for picnicking and community open space
- Facilities for public fishing activities
- Construction of a nature education center for general education of the public about the habitat types and wildlife in the area.

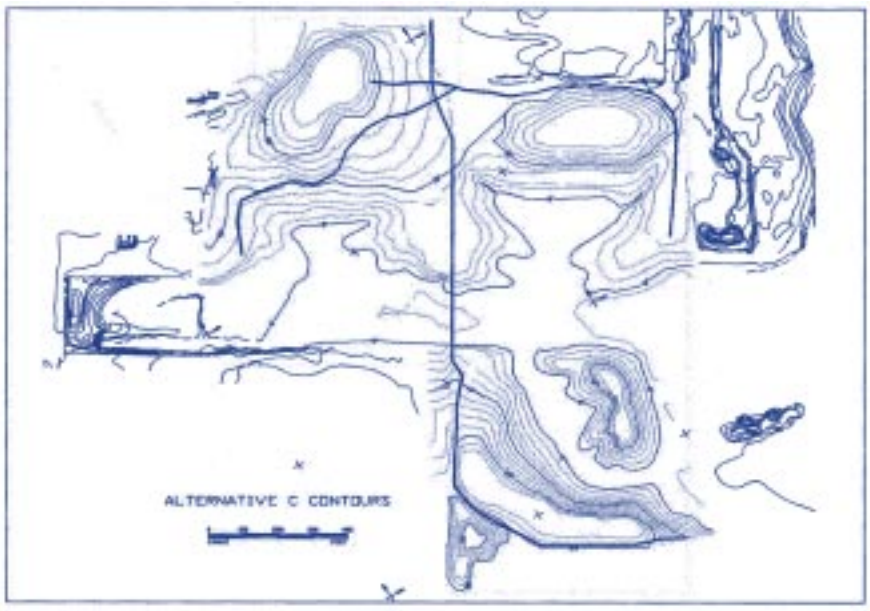


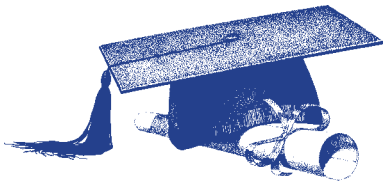
Figure 3. Alternate C– Conceptual topography and bathymetry of Yosemite Channel

All of the common elements are designed and located to inhibit intrusion on sensitive habitat areas and species.

After several meetings with State Parks, the State Parks Foundation, and environmental and community leaders, Alternative C was selected by State Parks as the most appropriate for meeting the objectives of the State Parks General Development Plan. In addition, Alternative C responds most clearly to wetland restoration priorities established by the Baylands Ecosystem Habitat Goals project, the San Francisco Bay Conservation and Development Commission bay protection and enhancement program, the South Bayshore Plan developed by the City and County of San Francisco Planning Department, and the Regional Water Quality Control District for improvement of San Francisco Bay water quality.

Funding for the Feasibility Study was provided through the California State Parks Foundation with a grant from the San Francisco Airport Commission. Presently, planning is underway for the Final Design and Engineering Specifications for Alternate C construction.

ADVANCEMENT
AWARDING EXCELLENCE



The College of Science and Engineering (COSE) fosters student advancement and continually strives to acknowledge academic achievement. The college's many scholarships and grants represent an ongoing effort to provide financial assistance and recognition to outstanding COSE students. Awards range from merit to community service-based scholarships, to reimbursement for research project expenses. This variety of options encourages academic growth and helps prepare students for cutting-edge scientific careers.

The COSE scholarship committee, headed by Dean Sheldon Axler, reviewed a total of twenty-six applications and rewarded eight scholarships for a total of $6,500—one graduate, seven undergraduate—for the Fall 2002 semester. The scholarship recipients comprised a diverse body of science and engineering disciplines, including Mathematics, Computer Science, Biology, and Electrical Engineering.

The **$500 C.Y. Chow Memorial Scholarship** was awarded to Jeremy Barker (Mathematics) and Limei Wang (Computer Science). Manli Li (Computer Science) received the **$500 David G.C. Cassa Memorial Scholarship**. The **$1,000 Community Service Learning Scholarship** was awarded to five students for outstanding community service and future community-related efforts: graduate Elizabeth Phillips (Biology) and undergraduates Darleen Franklin (Microbiology), Angela Guglielmino (Biology). Nelly Lau (Electrical Engineering), and William Riedy (Computer Science).

Under the **Student Project Fund program**, twenty COSE students were reimbursed a total of $4,600 for expenses associated with research, field work, and thesis presentations. Among the dynamic projects in research and development are a renewable solar polar generator, disease-resistant rice crops, computer programs that conduct oceanic sound surveys, detoxification remedies for harmful toxic algae, a portable heart-beat monitor that will prove an important tool in preventative medicine, pest management strategies, diabetes treatments, a solar-powered vehicle, a digital stethoscope, and preventative strategies for human pathologies such as Parkinson's disease. You are cordially invited to view some of these dynamic projects at the college's annual Student Project Showcase and Alumni Reception (see invitation on page 3).

The aforementioned scholarships and awards were made possible by generous donations to the College of Science and Engineering. The selection process for this year's awards was a difficult one, as the majority of applications were of superior quality. While COSE attempts to distribute as many awards as possible, the scholarship committee wished more financial resources were available to acknowledge all of the outstanding applicants. The committee's primary aim for the upcoming academic semester is to expand the Scholarships and Awards program, a goal that can only be realized with the aid of your generous contributions.

Your donations would provide much needed financial support for students and foster the college's goal of awarding excellence in academic and community achievement. For more information on making a contribution, please contact Lannie Nguyen-Tang, Coordinator of Alumni Relations and Student Projects, at (415) 338-7662 or e-mail science@sfsu.edu. Your contributions, for which no goods or services were exchanged, are tax-deductible to the full extent of the law.

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New Associate Dean continued from page 1

sional undertaking and he single-handedly built the digital/computer program into the most successful and respected program in engineering at Cleveland State. Dr. Hu has completed many microprocessor-based projects, received a patent on one such project, and published many papers on the subject.

Dr. Hu's desire to live in the Bay Area brought him to SFSU. In 1980, the electrical engineering program at SFSU was in great need for development and Dr. Hu eagerly accepted the challenge. Dr. Hu and Dr. Franco (joined by several others later) built the electrical engineering program essentially from the ground up. Dr. Hu always had a good sense of where technology was moving. Besides microprocessors, he was among the nation's early leaders

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New Associate Dean continued from page 6

in teaching Verilog (a hardware descriptive language now in wide use) and testability design in digital systems.

Dr. Hu considers students as the first priority. In his thirty years of teaching, he has always had an open door policy. He gives students as much time as they need. One of the reasons that Dr. Hu became the associate dean is that he wants to make a difference for the students. "To be helpful to students does not mean to be lax or to lower the standard, however," cautioned Dr. Hu. "Students find my courses very demanding and exams difficult; but they also say that they learn a lot. Students must also learn and follow policies and regulations as this is necessary to do well in industry and in society." Dr. Hu believes that a college degree not only represents that a student has acquired a certain amount of professional knowledge and skill, it also means that the student has learned to make responsible decisions and has successfully managed the demands and rigors of a college program.

The sixth of eight children, Dr. Hu was born in mainland China and raised in Taiwan. With his educational background in both sides of the Pacific, he possesses a "good" mix of the eastern and western values, philosophy and thinking. When not dealing with academic issues, he enjoys concerts, plays, musicals, operas, sporting events, and being out in nature. "I am really lucky," reiterated Dr. Hu. "I have a job I really enjoy, great colleagues, a supportive wife, three marvelous kids, and live in the best location in the world."

Support the College of Science and Engineering!

Often we reach the point where we are in our professional lives because of assistance or support from someone along the way. Whether it was a professor who took the time to help you with a difficult equation, or a fellow student whose drive to succeed inspired you, your time at San Francisco State University helped to shape who you are today.

As you are reading about the wonderful stories in this newsletter, we hope that you will consider making a tax-deductible gift to the College of Science and Engineering at SFSU. More and more alumni and friends of the University are providing private support to an institution that has given them so much. Private support from SFSU alumni and friends has become more important than ever as state budget cuts expand. Your gift will assist students by sponsoring scholarships, increasing internship opportunities, upgrading and purchasing new equipment, recruiting and retaining outstanding faculty, and supporting new academic programs.

You may direct your donation to a specific program, department, or purpose, such as the Student Project Fund. You can be a sponsor for the prizes at the Student Project Showcase in our annual event (please see page 3 for details about this celebration), start a scholarship for a deserving student, support faculty research, or give an unrestricted gift to the Dean's Fund, which will be used wherever the need is greatest.

You can make your gift by filling out this form and returning your check (made payable to the SFSU Foundation) or credit card instructions. If you would like to discuss specific giving options, such as setting up a new scholarship or making a gift of stock, please contact Lannie Nguyen-Tang at science@sfsu.edu or (415) 338-7662.

Thank you, again, for your generous support.

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I would like to donate $ _____ to: ❒ Student Project Fund ; ❒ COSE Alumni Chapter (for newsletters and activities); ❒ COSE Department of _____ (please specify); ❒ My Favorite Scholarship/Fund _____ (please specify); ❒ COSE Dean's Fund which will be used wherever the need is greatest.

❒ **I am interested in establishing a new endowment scholarship** ($10,000 minimum), please contact me.
Enclosed is $ _____ or Charge to: Visa ____ Master Card ____ Expiration Date _____

Account #_____ Signature_____

Please send this completed form to SFSU, College of Science & Engineering, 1600 Holloway Avenue, S.F., CA 94132-4163.

State of the College continued from page 1

scholars. If because of our high standards we do not fill all fourteen positions, then we will redo searches for the unfilled positions in following years.

Six new tenure-track assistant professors joined our faculty this year. Remarkably, all six were the first choice of the departmental Hiring Committee, the Chair, and me, even though we receive dozens and sometimes hundreds of applications for each faculty position. As you read about the following new faculty, you will see why our College takes such huge pride in what we do:

Teaster Baird, Assistant Professor of Chemistry and Biochemistry, received his Ph.D. in protein biochemistry from Duke University. Teaster's most recent position was as a Postdoctoral Fellow at the University of California, San Francisco. Teaster's research focuses on biotechnology and proteomic technology development through protein engineering of serine proteases. Teaster is the recipient of a postdoctoral fellowship from the National Science Foundation.

Todor Cooklev, Assistant Professor of Engineering, received his Ph.D. in Electrical Engineering from Tokyo Institute of Technology. His most recent position was with Aware, Inc. Todor previously worked at 3Com, where he received the 3Com Inventor Award in 1999. Todor is the inventor on over 15 patents issued or pending. His book on "Broadband Wireless Communications Standards", an area that he helped develop, is about to be published. Todor's research focuses on wireless communication systems, digital signal processing algorithms, and standards and protocols for communications.

Edward Lank, Assistant Professor of Computer Science, received his Ph.D. in Computer Science from Queen's University in Canada. While still a graduate student, Ed won the Best Paper Award at the annual conference of the Center for Advanced Studies in Canada. Ed's most recent position was as a Research Scholar at the Xerox Palo Alto Research Center. Ed's research focuses on human-computer interaction, pen computing, and interactive diagram recognition.

Arno Puder, Assistant Professor of Computer Science, received his Ph.D. in Computer Science from the University of Frankfurt in Germany. His most recent position was at AT&T Research Labs in Menlo Park. Arno wrote the public-domain implementation of the CORBA middleware system and is also the author of the book describing that software. Arno's research focuses on conformance testing, middleware systems, and embedded systems.

Britta Swanson, Assistant Professor of Biology, received her Ph.D. in Medical Microbiology from Texas Tech University, where she won several awards for her work during her doctoral training. Her most recent position was as a Postdoctoral Fellow in the pathogenesis of pseudomonal lung infections at the University of California, San Francisco. Britta's research focuses on the molecular mechanisms by which certain bacteria cause infections in imunno-compromised patients. Specifically, she is interested in a novel secretion mechanism by which the bacteria inject toxins into target cells.

Albert Uy, Assistant Professor of Biology, received his Ph.D. in Biology from the University of Maryland, where he received the university's Outstanding Research Award for his dissertation work. His most recent position was as a Postdoctoral Fellow in Biological Informatics at the University of California, Santa Barbara. Al's research focuses on understanding how changes in signals used to recognize potential mates can result in mating barriers, leading to the formation of new species. He has studied several species of bowerbirds and manakins as model systems, and is planning a new project using guppies from the island of Trinidad. Al is the recipient of a postdoctoral fellowship from the National Science Foundation.

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