College of Sciences • San Diego State University

# SCIENCES REVIEW

2003

College of Sciences
SAN DIEGO STATE UNIVERSITY

# Development Update: Henry D. Steele

Since assuming my post as development director last August, I have had the pleasure of meeting numerous students, faculty, alumni and other friends of our college and university. My wife, Bonnie, and I thank you for your welcome and continuing hospitality and look forward to visiting with many more of you.

As one of my initial tasks, I wanted to better understand how the College of Sciences fulfills its mission within SDSU's mission as mandated by the California State University system. I learned that our college is dedicated to offering its students a strong, practical education enhanced by hands-on work in laboratories with their professors, and that our college is recognized for the quality of its graduates who enter the workforce and rapidly become productive employees.

However, we cannot rest upon our success if we are to be truly responsive now and in the future to the needs of our students and to our local, regional, national and international constituencies. We must be able to attract and retain outstanding faculty, to strengthen teaching and research programs, to draw and assist top students and to purchase much-needed laboratory equipment.

Such ambitious goals will require a substantial and continued increase in philanthropic support by old and new friends. As a first step toward that objective, over 135 alumni, faculty, faculty emeriti, students, businesspersons, foundation officials and other community leaders were invited to participate in a major gifts planning study. During the course of our confidential interviews, they shared their thoughts and suggestions about our college's current activities and about our plans for future education and research programs.

We expect that the study will be completed during June and its results will be incorporated into the college's strategic plan that is being prepared. It is very satisfying to be part of such an important process that will help our college better serve its constituents for many years to come.

On an operational level, we reformatted our yearly newsletter, Sciences Update, so that we could more frequently keep a greater number of our friends informed about the college. We also are periodically sending brief notes from Dean Scott about current activities to those who have supplied us with their e-mail addresses.

In addition, you will note that our annual report, Sciences Review, is in a new, briefer format. Again, this step was taken to reach a larger audience without increasing our operating expenses.

With such cost-saving measures in mind, our out-of-state friends will be notified that the report will be available for their review on our college's website rather than mailing it to them.

We recognize that many of you want an opportunity to hear first-hand from Dean Scott and faculty members about the college's current and planned education and research programs. In response, we are initiating a series of social and informational meetings in the San Diego area. We hope to enlarge the series to include major cities in California and, eventually, other areas where our friends reside.

I am happy to report that the College of Sciences continues to benefit from the generosity of those who are interested in maintaining its excellence in teaching and research. As we go to press in mid-May, our friends already have contributed over $1,000,000 in cash or other assets and, of course, we hope for further gifts by June 30. (We have been so bold, dear reader, to include a pre-addressed envelope for your convenience.)

Others have notified us of their intentions to include the College of Sciences in their estate plans. By their thoughtful generosity, these members of the SDSU Heritage Society are helping to assure the college's future financial strength and stability.

We are most grateful to our friends for their immediate and deferred gifts. During such a troubling year at home and abroad, we especially appreciate their continuing interest and support.

Please feel free to contact me when you have any questions about our college or its plans for the future.

Henry D. Steele
Director of Development
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**ABOUT THE COVER**

On the cover is an artist's rendering of the planned $13 million 33,000 square foot SDSU BioScience Center. The center will offer research, education and professional training to SDSU students and faculty and other scientists in modern laboratories with up-to-date equipment. The purpose of the BioScience Center will be to:

- seek treatments to heart disease, antibiotic-resistant bacteria and emerging infectious diseases
- provide a laboratory-based science education of students so they enter the workforce as skilled professionals
- offer workforce development opportunities responsive to needs of the life sciences industry

# Message from the Dean: Dr. Thomas R. Scott

A year ago I began this message with the words "we have celebrated a year of...." Anyone who has followed the financial reversal in California will know that the past year has not been one of celebration. What positive signs can we find in this time of austere budgets and increasing costs? In fact, a gratifying number. Our physical facilities continue to improve, we are having an ever-greater national impact on scientific research, we serve a large and improving student body and are integral to the economic success of San Diego's technology-based community.

Our physical plant is undergoing a transformation. The dismal if serviceable Chemistry-Geology building (CG) has been reborn as an attractive office building housing the departments of mathematics, computer sciences and the department offices of chemistry and geology, plus advising and the Dean's offices. The new name is notably uncreative-geology, mathematics and computer science (GMC)-but may be only temporary. Members of the Dean's staff are particularly pleased to have vacated the temporary trailer that housed us for twelve years in favor of space that has, among other amenities, plumbing. The noble triple-wide trailer will not be retired, but will be taken to Santa Margarita Ecological Reserve, the largest of our Field Stations, where it will serve as housing and office space for our ecologists.

The five-story BioScience Center that will occupy the space upon which the Dean's trailer stood will house our expanding molecular biology program. The basement will have animal quarters, the first floor, office space. The remaining three floors will accommodate 15 research labs devoted to the Heart Institute, the Center for Microbial Sciences, the Genomics Center, and the Molecular Biology Institute. This will become a cynosure of research on cardiovascular disease and a center for addressing the nation's concern about bioterrorism. The BioScience Center will emphasize research and graduate training-therefore it is not eligible for State support. Rather, the $13 million expense must be borne by private concerns. In December 2002, the SDSU Foundation committed $8M to permit construction to begin. Raising the remainder is the leading funding priority of the College of Sciences.

Construction of the Coastal Waters Lab, to be located at the site of the former Naval Training Center on S.D. bay, has been slowed by city regulations and community concerns, but should be underway late in 2003. The U.S. Geological Survey will use a portion of the building for offices, while the research labs of our marine ecologists will occupy the remainder.

The Visualization Center that occupies the ground level of the Chemical Sciences Lab has continued to serve as a sophisticated nexus for national communication. In January of this year, the massive security operations surrounding the Superbowl (played in Qualcomm Stadium) were run from the Viz Center. Our computational scientists collaborated with law enforcement agencies from the federal to local levels to monitor activity around the game and to plan for possible emergencies. There were scores of remotely operated cameras around the stadium, microphones concealed in the surrounding shrubbery programmed to detect the vibrations created by large bipedal mammals and chemical sensors in and along the banks of the San Diego River equipped to detect toxins in the water supply. Men in bio-isolation suits paced near the stadium. A national network of enhanced reality connections was open before and during the game through which medical specialists standing by at sites around the country could monitor, diagnose and direct the treatment of victims of a mass attack. All information was sent through wireless connections to the top of Qualcomm, from where it was relayed to an SDSU dorm, then by fiber to the Viz Center. During the game, the screens of the Center were alive with images from 16 cameras and masses of audio and chemical information in real time. The day's only disaster belonged to the Raiders, but the effort of coordinating our capabilities with those of local law enforcers, the FBI, CIA and the Office of Homeland Security taught us lessons that will serve us well in helping San Diego cope with emergencies of the future.

Research from the College of Sciences reached record levels in the past year. Our faculty published 368 refereed articles, 44% of them in collaboration with graduate and undergraduate students in our labs. We won $30 million in external funding for our research, an average of $167,000 per faculty member. This addition to the San Diego economy is more than double the average salary and benefits a faculty member earns, and reflects once more what a valuable contribution our research-oriented scientists make to the community.

SDSU had 43,000 applications for admission this year. Of these, approximately 30,000 were seeking entry to the freshman class, and were CSU-eligible. SDSU was able to admit only about 20,000 in anticipation of filling an entering class of just over 7000. Those admitted have an average high school GPA of 3.6 and SATs of 1089, making them the best-credentialed group in our university's history.

I cannot summarize the past year without addressing the budget situation that threatens to undo much of our progress of the past three decades. State support continues to be the core of SDSU's funding, the reliable flow of renewable resources from which we hire faculty, lecturers, staff, TAs, and from which we derive basic operating budgets. Upon our state allocation we overlay federal and philanthropic support that makes SDSU the flagship institution of the 23-member CSU system. Reductions in our state allocations require us to modify our delivery of classes. A number of faculty will have increased teaching assignments, replacing lecturers in the classroom. Class sizes will rise, particularly in the lower division where courses will be offered in larger lecture sections. The Women's Gym in the department of Exercise and Nutrition Sciences is being transformed into a 500+ seat lecture theatre in which COS will offer introductory courses in chemistry, biology and psychology beginning this fall. Our tasks are to sustain our strength through this financial strait, while continuing to advance in selected areas, notably biochemistry, molecular biology and computational sciences. We will cope with the reductions of 2003-04 with frugality, efficiency, non-renewal of some contracts and the use of university reserves. What awaits us in 2004-05 may be of even greater concern.

On the following pages you will find summaries of the events in each of our eight departments from the past year. We encourage you to maintain contact with your department, and to provide the allegiance and support that will be necessary if we are to emerge from these years as a vital teaching and research institution.

Thomas R. Scott

# Astronomy

Department Chair: Dr. Paul B. Etzel

*Orion Nebula, Photo by Grad Student Del Johnson*

Jerome Orosz works on optical observations of a wide variety of objects, including eclipsing binaries, binary systems containing evolved stars, binaries containing neutron stars and black holes, and the observation of gamma-ray burst objects. Observations are collected with a variety of telescopes worldwide, but the large blocks of time available with the 40-inch telescope at Mount Laguna Observatory allow for extended series of observations not possible elsewhere. Orosz and graduate student Brodney Fitzgerald have recently obtained extensive observations of the black hole binary XTE J1118+480 and the decay of the optical afterglow of the gamma-ray burst GRB 030329.

William Welsh's research interest is focused on ultra-dense compact objects, including black holes in binary star systems and in quasars. He makes extensive use of the Hubble Space Telescope in his research, along with several ground-based facilities including Mt. Laguna Observatory. Welsh is heavily involved in a proposal to NASA to build a mid-Explorer class satellite ("Kronos"). He has also recently extended his research into the exciting field of extrasolar planets.

Eric Sandquist focuses on collisions of stars with planets or other stars, and the physics of star interiors. He primarily studies star clusters, which provide us with one of our best ways of measuring ages in the universe. Clusters are also environments where star collisions appear to be relatively frequent. Sandquist has recently been studying the products of stellar collisions in the cluster M67, and was also awarded an NSF grant to study denser globular star clusters (with graduate students Jonathan Hargis and Lee Clark).

Betty Buller Whitehead recently endowed the Reginald F. Buller Award for Service to celebrate her father's life and service to SDSU's Mount Laguna Observatory. The award of up to $1,000 annually is directed to Astronomy Graduate Students. This year, the SDSU Astronomy Department dispersed $13,300 in scholarships and awards to its undergraduate and graduate students.

# Biology

Department Chair: Dr. Christopher Glembotski

*Artist's rendering of the planned SDSU BioScience Center*

The Department of Biology faculty members, staff and students have been very busy this year in the classroom, in the field and lab, teaching and doing research on diverse topics ranging from molecular and cellular biology to organismal biology.

Faculty and students earned $9.6M in research awards this year, more than any other year. This achievement and many others will be celebrated at the 8th Annual Biology Banquet that will be held on May 23 at Marina Village.

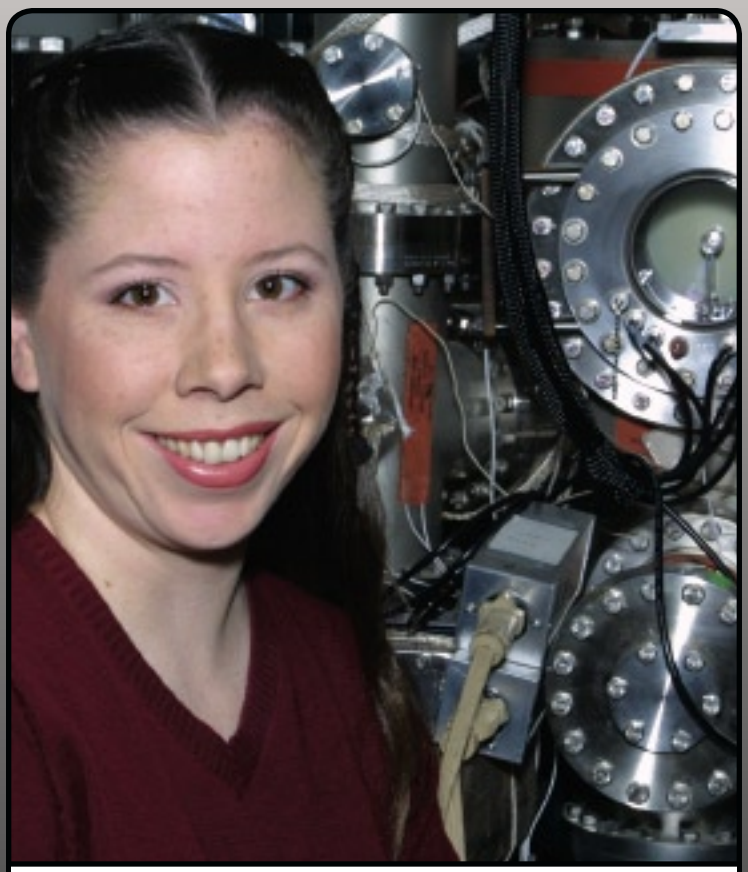
Awardees in several categories will be recognized at the banquet. Beth Cole received the outstanding graduate student award this year and named Chris Glembotski as the professor who was most influential in her education. Cole intends to go to medical school in the fall and says that her classroom and research lab training at SDSU have played a critical role in preparing her for her future academic adventure.

Mike Van Patten has been named as the outstanding instructional technician. He works with the evolutionary biology faculty and students. Kevin Krown, who has taught physiology and molecular biology at SDSU for many years, is the 2003 outstanding lecturer. The teacher/scholar awardee is Terry Frey, biology professor and faculty director of the SDSU Electron Microscope facility. Frey is acknowledged for his outstanding research accomplishments this year, as well as excellence in teaching and dedication to students.

Biology faculty retiring at the end of the 2003 academic year include Vernon Avila, Michael Briendl, Paul Paolini and Skai Krisans. Their contributions over the years are very much appreciated.

# Chemistry

Department Chair: Dr. Carl Carrano



*Monica Neuburger, Ph.D. (Former SDSU Student )*

The Department of Chemistry welcomes their new chair, Carl Carrano, who joined the department this spring from Southwest Texas State University. There he served as department chair from 1988 to 2000. Carrano received his B.S. with honors at UCSB and his Ph.D. from Texas A&M University. He has published extensively in the field of bioinorganic chemistry, is the author of over 125 research publications and the North American editor for the International Journal of "BioMetals". His emphasis is inorganic chemistry and his interests include metalloproteins, zinc and vanadium chemistry and biochemistry, as well as iron transport and storage. The department looks forward to Carrano's leadership.

Chemistry also welcomes their newest faculty member, Gillian Roehrig. Gillian arrived in the fall from the University of Arizona where she obtained her Ph.D. as well as providing undergraduate instruction. Gillian's emphasis is in Chemical Education and her research interests are focused on issues related to the implementation of inquiry-based instruction in both secondary and undergraduate classrooms. She is currently working closely with San Diego City Schools on evaluation related to a chemistry curriculum for all 10th grade students, as well as teacher development in both chemistry content and inquiry-based pedagogy.

Andy Cooksy and John Love were Principal Investigators this year on a $140,000 instrumentation grant to purchase a computer cluster for computational science research. The cluster will be used to study the impact of molecular structure on fundamental chemical processes in combustion, interstellar chemistry and biochemistry. It will be administered by the Computational Science Research Center and will be available to researchers throughout the College of Sciences. Faculty in Astronomy, Physics, Biology and Mathematics also contributed to the proposal.

A sincere thank you goes out to John Woodson from all of the College of Sciences for his dedication and hard work over the past forty-two years. Woodson's participation in the Faculty Early Retirement Program is coming to an end in May. We wish him the best of luck in his future endeavors.

# Computer Science

Department Chair: Dr. Leland Beck

*Participants in a wireless conference from SDSUs "VisLab" to the Anza-Borrego Desert*

The College of Sciences is pleased to announce the formation of the newest department—Computer Science. Leland Beck is the chair and there are many exciting developments within this department.

A community service-learning program was initiated in the fall of 2002. Through this program, CS students earn three units of credit while providing software engineering services for a not-for-profit organization. Organizations supported this year include the City Heights Community Technology Center (chartered to bring technology and internet access to an extremely diversified low income neighborhood), the Cancer Clinical Services Quality Assurance Project within the SDSU Graduate School of Public Health and a debt counseling organization that offers credit counseling services to help consumers break free from debt. Students set up computer system administration procedures, implement databases to support business objectives, automate reporting requirements and set up web pages to help the organizations reach their target audiences.

Robotic person following is the newest project developed at the Intelligent Machines and Systems (IMS) laboratory directed by Mahmoud Tarokh. This project builds on previous research projects of the IMS lab that included the development of intelligent navigation and control of Rocky 7 Mars rover for NASA and a genetic algorithm based path planner sponsored by Lockheed-Martin. The robotic person follower uses an on-board camera to acquire images of the person and directs the robot to follow the person using a fuzzy logic based intelligent controller. It can recognize the person being followed and avoids collision with walls, tables, chairs and other obstacles. When fully developed, this type of intelligent robot can carry tools and equipment, provide vital information and assist with rescue operations. More information about this and other projects of IMS lab can be obtained by visiting the lab web page www-rohan.sdsu/~tarokh/lab/.

Accelerating globalization of the world economy has led to increasing interest and activity in software internationalization - methods for accurately and efficiently translating software developed for one culture and/or language into other cultures and languages. The first foray into software internationalization – translation of Academic Systems Corporation's mathematics courseware from English into Spanish – was successfully completed in fall 2002. Currently there are negotiations underway with international universities and corporations to establish a variety of collaborative programs and certifications in software internationalization.

Faramarz Valafar leads the Bioinformatics, Medical Informatics, and Cheminformatics research group. These fields encompass the application of mathematical and computer scientific techniques in biological, medical, and chemical sciences. Valafar's research also includes high performance computing in the form of parallel and distributed processing, especially for biological, medical, and chemical applications.

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# Geological Sciences

department chair: Dr. David Huntley

*Mount Etna erupting*

The Department of Geological Sciences is pleased to share the recent accomplishments of its faculty.

The Paleontological Society named Lindsey Leighton, a paleontologist who arrived in the spring 2002 semester, a Distinguished Lecturer for the years 2003-2004. Leighton's primary research interests center around understanding why organisms have the shapes they have and the relationship between morphology and biodiversity. He examines how environment, development and physiological constraints literally shape a lineage through deep time. This will further our understanding of how the relative roles of competition, predation and non-equilibrium processes influence biodiversity through time. The quality and importance of his work has been recognized by the Paleontological Society award as well as the success of a recent NSF proposal to examine extinction survivorship in Terebratulide Brachiopoda.

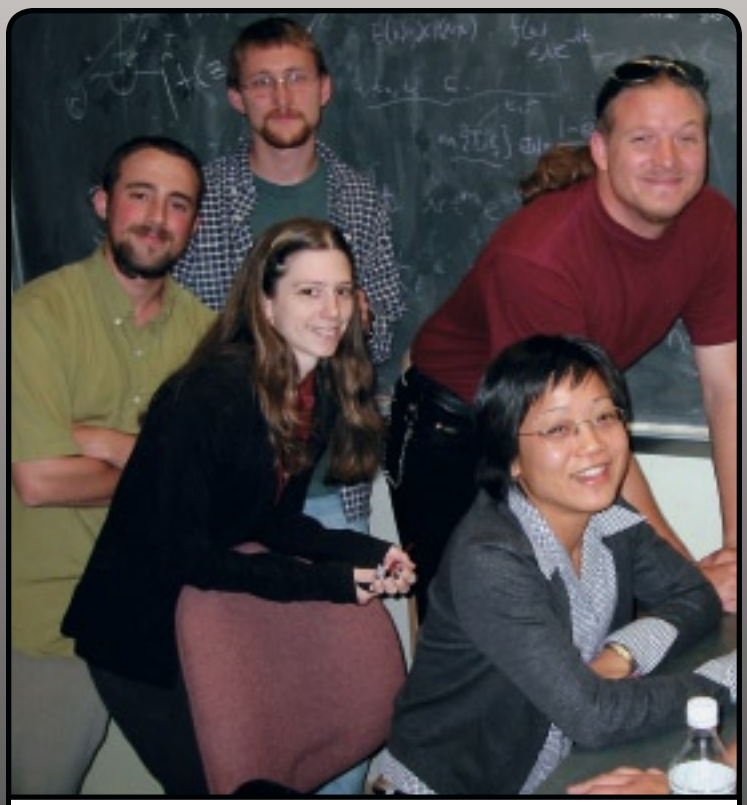
Another of the newest faculty members, Aaron Pietruszka, also appears to have a bright future ahead of him. Since arriving at the department in January 2003, Pietruszka has begun the process of setting up a new analytical facility for high-precision measurements of the short-lived daughter isotopes of uranium and thorium decay in geological materials. A component of this research was the establishment of a high-precision ICP-Mass Spectrometer. To that end, he and Barry Hanan oversaw the installation of the "Nu Plasma", a state-of-the-art plasma ionization mass spectrometer. This instrument was obtained with funding from the College of Sciences, this department, the Department of Chemistry and the National Science Foundation.

Even more exciting, Hanan (Geological Sciences) and Bill Tong (Chemistry) were awarded sufficient funds from NSF to upgrade the Nu Plasma mass spectrometer to the Nu 1700. This will be only the second mass spectrometer of this type in the world and the first installed outside of Europe. The resulting mass spectrometer facility at San Diego State University will be second to none, making SDSU a hub for isotope research worldwide.

Finally, it is with great pleasure to announce that the website "How Volcanoes Work", authored by Vic Camp, received the 2002 Golden Ace Award for Site of the Year from LightOS/A.N.G. Bond Ltd., in New York City, one of the major web-ranking organizations. This is the most prestigious of the Golden Ace Awards, given to a single site that is "deemed the very best from all nominated and judged sites throughout the calendar year." It won for the category of "Reference", being judged in three major achievement areas: technical merit, artistic quality and design/presentation. This website is attracting 350,000 hits per year and has received numerous positive comments that reflect well on SDSU as a scientific and educational institution.

# Mathematics & Statistics

department chair: Dr. David Lesley



*Math Students 2002*

The Departments of Mathematics & Statistics have moved into the newly renovated (and soon to be renamed) Chemistry-Geology building. Offices and labs occupy the fourth and fifth floors and there are classrooms on the third floor.

This year the department welcomed four new faculty. Peter Blomgren is a specialist in Numerical Analysis, with his Ph.D. from UCLA and a postdoc at Stanford. Susan Nickerson joins the Math Education group after receiving her Ph.D. from the joint program of SDSU and UCSD. The program in Statistics is greatly strengthened by the arrival of Juanjuan Fan and Richard Levine, both of whom were on the faculty at UC Davis. Rich's Ph. D. is from Cornell and Juanjaun's is from the University of Washington.

The outstanding graduating senior in 2002 was John Rodgers, who earned a B.S. with an emphasis in Financial Mathematics. Rodgers named Vladimir Rotar as his most influential faculty member. The outstanding graduate in 2003 is Kevin Brensike. Kevin earned his B.S. with an emphasis in Computational Science and named Donald Lutz as his most influential professor.

An Educational Partnership agreement has been signed with the Naval Postgraduate School in Monterey, California. It is expected that this partnership will eventually lead to teaching and research collaborations. The M.S. programs in the mathematical theory of communications and non-linear dynamics are both good candidates for such efforts.

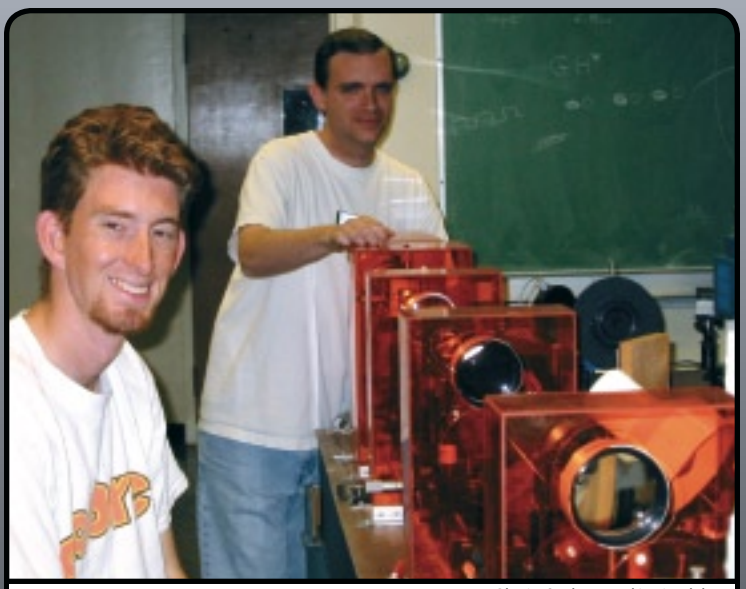
After raising the seed money from faculty, with matching funds from Bill Root's NExTWORK project, a tutoring program at Pershing Middle School and Hoover High School has been initiated. At each school about a dozen undergraduates, mostly engineering majors recruited from our Calculus classes, are paid to work with the teachers and students. The project is highly praised by teachers, students, tutors and administrators.

David Carlson, Nick Branca and Larry Sowder announced their retirements in January. All will enter the Faculty Early Retirement Program (FERP) and teach one semester per year for up to five more years. Arnie Villone has just finished his last term as a "FERPer." We hope to still see him on campus occasionally.

We are saddened to announce the deaths of Ed Eagle and Saul Drobnies. Ed taught in the Department form 1946 to 1974, and Saul was here from 1963 to 1994.

# Physics

Department Chair: Dr. Patrick Papin



*Physics Students working in a lab*

Two recently funded projects within the Department of Physics provide excellent research opportunities for students.

Calvin Johnson has just received funding from the Department of Energy's "Stewardship Science Academic Alliances Program." This three-year project will study nuclear level densities for a variety of isotopes relevant to areas from diagnostic radiochemistry to astrophysics. The grant will allow the department to hire a postdoctoral research associate.

The nuclear level density is a key input to statistical models of neutron-induced nuclear reactions. Johnson is proposing a "just-right" theoretical approach built upon the microphysics of the nucleus.

The motivation for this work comes from the need to understand a complex network of nuclear reactions in environments of extreme temperature, density and pressure. In principle, level densities can be measured experimentally.

But these experiments are labor intensive and somewhat impractical. Many of the relevant isotopes are very short-lived and impossible to measure systematically. The level densities and related quantities will be calculated at SDSU using a local Beowulf parallel cluster, with theoretical support from the Nuclear Theory and Modeling Group at Lawrence Livermore National Laboratory.

The second recently funded project is that of Milton Torikachvili's which studies the interesting phenomenon of the co-existence of ferromagnetism and superconductivity in hybrid rutheno-cuprate materials known as Ru-1212 and Ru-1222. It is quite unusual that superconductivity and magnetism coexist in the same material.

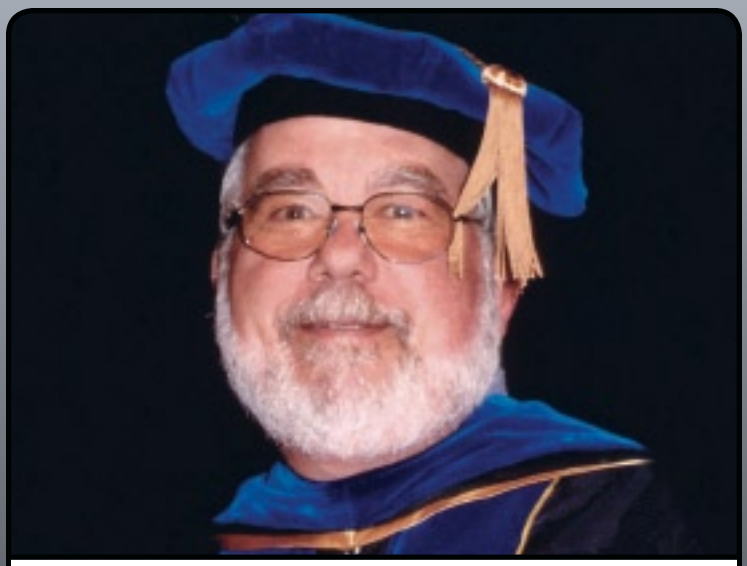
Superconductivity normally occurs with electrons formed in bound pairs spinning in opposite directions. Ferromagnetism is a result of electrons spinning in the same direction without the aid of an external magnetic field. Therefore, materials exhibiting superconductive properties should be displaying a non-ferromagnetic condition. Studies of the rare exceptions have lead to very important findings in the past.

The intellectual merit of the research resides in combining a set of supplementary experimental techniques and samples to address important issues pertaining to this unusual coexistence.

The broader impact of this project resides in the mentoring opportunities that it will create for the students. The grant also has included research support for two graduate students.

# Psychology

Department Chair: Dr. Fred Hornbeck



*Dr. Fred Hornbeck at Commencement 2002*

The Department of Psychology is pleased to announce that Kristin Hawley has been selected as the inaugural Oscar Kaplan Postdoctoral Fellow. The fellowship was established in memory of Professor Kaplan through the generosity of his widow Rose and his family.

Howley received her undergraduate degree summa cum laude from the University of Missouri-Columbia and her masters and doctoral degrees in clinical psychology from the UCL. Her research focuses on the examination of processes and outcomes of child and adolescent therapy in clinical practice settings.

This fellowship provides a two-year period during which the Kaplan Fellow can think, write, participate in the research of an established laboratory, and develop his or her own research program with guidance from a team of experienced researchers.

The department thanks Fred Hornbeck for 11 years of dedicated service as Department Chair and welcomes Claire Murphy as his successor. During Hornbeck's tenure as Chair the University has conferred 4,749 bachelors, 246 masters and 105 doctoral degrees in Psychology, and he has shaken as many hands as have presented themselves at graduation.

Hornbeck has been a strong proponent of the University's development into a Carnegie Doctoral/Research Intensive University. During his tenure, funding for research, development and instructional programs has increased 300% to nearly $9 million. The department ranked 18th nationally in NIH dollars in 2000, second in the state of California.

Claire Murphy arrived at SDSU in 1982; beginning her career here teaching and conducting NIH sponsored research on the chemical senses. She was hired into a tenure-track position in 1984 as the result of a national search. Now a tenured professor, she has been a popular and rigorous teacher of Psychology 410 as well as other classes.

The National Institute on Aging has funded Murphy's research on the effects of aging on taste and olfaction since 1982. She has also received support from the National Institute on Deafness and other Communication Disorders for the past eight years. She was one of the first to successfully record event related potentials from olfactory stimuli in this country. One of her current lines of investigation employs functional MRI in investigating smell and taste in health and disease.

New faculty members Scott Roesch and Thierry Devos have joined the department. Roesch received his PhD in social/personality psychology from the University of Nebraska in 1996. He completed a post-doctoral fellowship in Health Psychology at UCLA and then taught at CalPoly in Pomona.

Devos received his B.A., M.A., and Ph.D. from the University of Lausanne, Switzerland. He did a post-doctoral at UC-Santa Barbara. Before joining SDSU, he spent three years as a visiting fellow at Yale University.

Psy Phenomena, the alumni newsletter for the Department of Psychology can now be viewed on line at http://www.psychology.sdsu.edu/PsyPhenomena.html

# College of Sciences Research Centers and Institutes

The following research centers and institutes provide field experience and seminars with guest speakers that enhance the College of Sciences curriculum. The off campus sites include the Mt. Laguna Observatory and nearly 5,000 acres in four biological sciences research stations. This real world, research based experiential learning provides SDSU students with an edge in today's job market.

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Lindsey Leighton and Stephen Schellenberg, Co-Directors

**Center for Behavioral & Community Health Studies**
John P. Elder, Director

**Center for Behavioral Teratology**
Edward P. Riley, Director

**Coastal & Marine Institute**
Richard M. Gersberg, Director

**Computational Science Research Center**
Jose E. Castillo, Director
Donald R. Short and Faramarz Valafar, Associate Directors

**Center for Computer Simulation**
William A. Root, Director

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**Center for NExTWORK**
William A. Root, Director

We will be featuring these research centers and institutes in our periodic emails to our alumni. If you are interested in receiving this information, please send your email address to **cosalum@sciences.sdsu.edu** and we will add you to our list.

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