

COLLEGE OF ENGINEERING FACULTY/STAFF E-NEWSLETTER



SAN DIEGO STATE
UNIVERSITY
College of Engineering

January 2010

In the Spotlight

- The College of Engineering is scheduled for a power outage on Friday, January 15th from 6:00 a.m. until 2:00 p.m. This is a mandatory furlough day for staff, so all administrative operations will be shut down as well.
- The first day of classes for the spring semester will take place on Wednesday, January 20th

Tracking The Dean

Date	Event
1/6	Dean Hayhurst attended a breakfast honoring Bob Filner at the SDSU Alumni Center
1/11	Dean Hayhurst will meet with President Weber to discuss a potential NSF Proposal
1/12	Dean Hayhurst, along with Dr. German and Dr. Olevisky, will meet with officials from Picatinny Arsenal
1/12	Dean Hayhurst will attend a meeting regarding a proposal for NSF's Innovation Through Institutional Integration
1/20	Dean Hayhurst will meet with representatives from General Atomics
1/22	Dean Hayhurst will travel to India
1/25	Dean Hayhurst and Dr. Tummala will meet with officials from PSG College of Technology in India to discuss a new MS program as well as a new undergraduate student study abroad program for this summer
1/29	Dean Hayhurst will meet with officials from Anna University in India to discuss SDSU's participation in a new Green Sciences and Engineering Initiative

JDP Research Symposium Held

On November 20th the Fall 2009 JDP Research Symposium was held at the College of Engineering. With several faculty in attendance, all of the JDP students reported the results of their ongoing research and had the opportunity to learn the results of other JDP student's work. The majority of the JDP students are working in the area of Applied Mechanics and Materials while three students are focusing on Electrical Engineering-related research. The Engineering Research Symposium has been held three times since 2007 and is an important precursor to the SDSU Research and Scholarship Symposium.

There are currently 14 students participating in the Joint Doctoral Program and this year it is expected that the program will receive over 35 applications. The growth of this program is important to the college and our relationship with the University of California, San Diego. The JDP boosts the collaboration between the two institutions, enhancing the scientific pursuits at SDSU and enriching the activities of UCSD. JDP allows the SDSU College of Engineering to better serve the educational needs of the Region, the State and the Nation by facilitating collaboration with University of California, leveraging resources, and increasing the production of doctoral level graduates. JDP is also important in attracting research-oriented faculty.

Please mark your calendars now for the Campus Student Research Symposium, which will be held on March 5th & 6th at Aztec Center. The College of Engineering is always well represented in the symposium and the support of faculty and staff is essential to the success of our students.



Dr. Rand German: Research Update

We all hear about research and the growth of research funding at universities. Before World War II, the academic community in the US did not have a culture of external funding. Richard Feynman represented the end of the old culture, where excellent science did not require funding (he never had a graduate student).

Today university engineering programs are heavily measured by their external funding and that drives us toward research centers. The National Science Foundation studies centers, their operation (NSF will provide templates), impact, and social implications (education, outreach, diversity, economic development) and this has led to a book on best practices for research centers. This is important because the large, important technical problems society faces far exceed the solutions possible by the sole investigator. Instead centers have become the norm for academic research. One

The end of each semester marks the culmination of countless hours of hard work for many engineering students who are enrolled in their department's senior design courses.

It is a time of year when we can take a moment to stop and look at the interesting projects and research being done by SDSU Engineering students.

Some of the most innovative projects in the ECE Department included a Golf Club Alert System which utilizes passive RFID tagging and an audible alarm to help prevent lost or forgotten clubs on a golf course. An equally innovative project involved the creation of a navigation system to assist visually impaired shoppers in navigating grocery stores and locating products.

The Mechanical Engineering Department's seniors presented their project's and research at the SDSU BioScience center. These students are working on a wide range of topics including a solar powered air conditioning system and a land speed motorcycle.

The AE/EM Senior design projects mainly focused on the aerodynamics of various objects, including a motorcycle helmet aimed at optimizing lift and drag. Another group focused on the aerodynamics of trophy trucks, which are described as high-performance desert racing vehicles that frequently reach speeds upwards of 120 mph.

Civil, Construction, and Environmental Engineering students collaborated on the design of a waste water treatment plant. The project was based on a real local project, with industry partners providing design specifications and site-specific information. Working in groups with each student representing sub discipline experts, students had to navigate difficult site conditions and a complex regulatory environment to produce a design blending treatment processes, hydraulic function, structural capacity, vehicle access, foundation support, and constructability.

Congratulations to all of our students for their innovation and hard work.



investigator. Instead centers have become the norm for academic research. One compilation on research centers was provided by W. R. Tash and S. M. Sacks (*The Payoff - Evaluating Research Centers, Institutes, Laboratories Consortia for Success*, 2004).

They profile approximately 300 centers, including the CISP program I ran at Penn State. To save you much effort in reading this book or the follow-on supplements, here are a few bullet highlights relevant to SDSU and the maturation of our research program in Engineering.

- ◆ Centers - creation of new scientific knowledge, interdisciplinary, training of research workers, new challenges to beliefs and practices.
- ◆ Centers manage research to maximize the return on investment.
- ◆ Characterized by multiple projects, comprehensive efforts, mission driven semi-autonomous efforts.
- ◆ At the university about 66% of the effort is on basic research, and in engineering the balance is applied work.
- ◆ Centers should have mission, plans, reporting, and performance goals.
- ◆ Most centers struggle with valid measures of outcomes.
- ◆ Metrics of success are based on external peer reviews, publications, proposal success, and internal management reviews.
- ◆ NSF engineering research centers are termed the "most micro-managed centers in the world."

A typical university center has 10% university funding, 10% state funding, and the balance is a mixture of member dues, endowments, gifts, contracts, and government support. This is very typical of the Engineering Research Center program from NSF. About 1/3 of the support is from federal sources. Note the support of graduate students transfers center funds to the university education funds in the form of graduate tuition payments. Most universities recognize this transfer as well as the overhead payment, so they return some of those funds to the center that is why 10% university funding is typical.

In engineering, the criteria for measuring centers success includes several factors:

- ◆ technology transfer - number of disclosures, inventions, companies, consultations, testbeds, nondisclosure statements, student training, and joint development programs
- ◆ industrial linkages - contracts with industry, company visits and visits to companies, revenue from companies, licenses
- ◆ external support - absolute funding, number of sponsors, number of contracts, mean dollars per contract, overhead recovery, graduate students supported, in-kind support
- ◆ internal support - amount of space, overhead return or university investment, instrumentation access, central facilities, promotion and tenure actions
- ◆ research quality - publications (peer reviewed), conference presentations, industrial collaborations, awards by peers in science community, competitive prestigious grants (NSF, NIH), chairing conferences or symposia, invited presentations

A few highlights of the typical successful center profile include the following:

- ◆ minimum of one archival journal per faculty and researcher per year
- ◆ 40 to 50% of personnel are students
- ◆ 1,000 square feet of center space per senior researcher
- ◆ center is within 10 min. travel time to academic offices

and the list goes on to include number of proposals, dollar value of proposals, symposia, conferences, faculty release time, student support, new faculty slots, industrial advisory board, shared instrumentation, and number of conference papers per faculty member per year (5 is average).

All of this is relevant as the SDSU College of Engineering moves into a final proposal with the University of Washington and Massachusetts Institute of Technology for a joint Engineering Research Center. The effort has passed the first round and been invited to final proposal submission (1 of 21 efforts around the nation). Good luck to our team putting together this proposal in neural engineering headed by Kee Moon.

Rand German



Angeline Villanueva Yang is the STEM Talent Expansion Program (STEP) Partnership of San Diego (SPSD) Program Coordinator for MEP at SDSU, and MESA Programs at Southwestern College (SWC), and San Diego City College (SDCC). Her primary responsibilities include coordinating the annual joint activities of a 1.9 million dollar National Science Foundation (NSF) grant. She has been at SDSU for almost 2 years.

Prior to working for MEP and MESA, she worked in Residential Life at Sixth College and the Computer Science and Engineering Department at the University of California, San Diego (UCSD). She is currently a member of NASPA – Student Affairs Administrators in Higher Education and a co-advisor of Pacific Asian Society of Engineers (PASE).

Ms. Yang holds a B.A. in Human Development from UCSD; the Certificate in College Counseling from UCSD; and the M.A. in Educational Leadership with emphasis in Student Affairs from SDSU. In her spare time, Ms. Yang likes to spend time with her husband and friends, go to the driving range, and try out vegan desserts.



Eric Pamintuan was hired as the administrative assistant for the STEP Partnership of San Diego (SPSD) / MESA Engineering Program (MEP) collaborative in Fall 2007. Eric conducts day-to-day office management for MEP as well as support and lead responsibilities for the MESA programs at the SPSD partner campuses, San Diego City College and Southwestern Community College.

Eric graduated from SDSU with a B.A. in Public Administration in 2007. His previous work experience includes interning at the Naval Base San Diego Fleet and Family Support Center and various graveyard shifts at Toys R' Us and Target. Born in Lemoore and raised in San Diego, Eric currently resides in Chula Vista with his girlfriend of 10 years.

Eric is actively involved in the continued development of the open source blogging platform WordPress and enjoys playing with his family's Pomeranian, Chubbs, flag football, and updating his status on Facebook.com every 5 minutes.

Research Corner—Projects Submitted & Awards Granted in December

<u>Name</u>	<u>Dept</u>	<u>Title of Project</u>	<u>FA</u>	<u>Status</u>
Dr. Ashkan Ashrafi, Co-PI Dr. Santosh Nagaraj	ECE	Theory and Applications of New Band-limited Orthogonal Continuous and Discrete Signal Sets	NSF	Submitted
Dr. Ed Beighley	CCEE	Reducing Potential Storm water Runoff Toxicity Using Limestone Linings	GC	Awarded
Dr. Asfaw Beyene	ME	ARRA: Industrial Assessment Centers	US DOE	Prior
Dr. Asfaw Beyene	ME	IAC Coronado Naval Base - North Island	UTB LLC	Submitted
Dr. Rob Dowell	CCEE	Simulation and Testing to Support Seismic Design of Anchorage	UCSD	Submitted
Dean David T. Hayhurst	DNS	SDSU Society of Women Engineers, National Society of Black Engineers and Society for Hispanic Professional Engineers Chapters	NGC	Awarded
Dr. Gustaaf Jacobs	AE/EM	High-order Particle-mesh Algorithms Based on Hybrid WENO-spectral Methods for Simulation of High-speed Particle- and Droplet-laden Flows	DOD	Submitted
Dr. Sam Kassegne	ME	Optical Characterization and Modeling of AllPolyPV Organic Solar Cells to Establish Optimized 3D System Architecture for Increased Performance	NSF	Submitted
Dr. Sunil Kumar	ECE	Design of Intelligent Cross-layer Routing Protocols for Airborne Wireless Networks Under Dynamic Spectrum Access Paradigm	DOD	Awarded
Dr. Sunil Kumar	ECE	Robust H.264 Video Packetization and Prototype of Video Streaming in Multi-hop Airborne Wireless Networks	DOD	Submitted
Dr. Eugene Olevsky, co-PI Dr. Rand German	ME	Advanced Anti-Armor and Thermo-Resistant Booster Net-Shape Components by Spark-Plasma Sintering	MDA	Submitted
Dr. Ken Walsh	CCEE	NEESR-CR: Full-scale Structural and Nonstructural Building Systems Performance During Earthquakes	UCSD	Awarded
GC = Geosyntec Consultants UTB LLC = UT-Battelle, LLC MDA = Missile Defense Agency				

Faculty and staff are invited each month to submit stories, story ideas and photos that you would like to see included in this newsletter. Please contact Carly at chouse@mail.sdsu.edu or at 4-0605