

COLLEGE OF ENGINEERING FACULTY/STAFF E-NEWSLETTER



SAN DIEGO STATE
UNIVERSITY
College of Engineering

March / April 2010

In the Spotlight

- **The Spring 2010 Faculty Business Meeting** is **Thurs. May 6** from 11:00—1:00 in E-300. Lunch will be served.
- **Commencement** is Sunday May 23. Please plan to attend this important event to recognize our students' achievements.
- Engineering's final enrollment for the Spring semester is 972.7 full time equivalent students (FTES), which is 112.8% of target and slightly lower than Spring 2009 (979.15).

Dean's Calendar

Date	Event
4/13-14	Dean Hayhurst will attend the ASEE Engineering Deans Institute in St. Petersburg, FL.
4/15	Dean Hayhurst has been invited to attend a workshop entitled "Education Opportunities for Veterans with Disabilities" at Walter Reed Army Medical Center in Washington D.C.
4/20	Dean Hayhurst will have lunch with Julie Meier-Wright, CEO of the SD EDC and member of the PLTW National Steering Committee.
4/22	Dean Hayhurst will attend the Kyoto Prize Symposium.

Explore SDSU Day a Great Success

On Saturday, March 20, the College of Engineering hosted an excellent turn-out of 350-400 prospective students and visitors for Explore SDSU Day 2010. Participating this year from the College of Engineering were over fifteen faculty, fourteen clubs, numerous industry representatives and eleven staff members.

Each year, thousands of people gather at San Diego State for Explore SDSU Day. Explore SDSU Day is an annual event for prospective students which includes presentations, campus tours, and entertainment. In addition to campus-wide information sessions on topics such as living on campus, financial aid and scholarships, each college organizes activities to enable prospective students



to interact with faculty and staff of the major they are interested in pursuing. For prospective students admitted to SDSU for Fall 2010, information and tours experienced on this day are pivotal in their selection of a University, so hosting a top-notch event is critical component in the College's efforts to attract the highest quality students to our College.

Dean Hayhurst started the day with welcoming remarks in the courtyard, followed by presentations by the department chairs on the strengths and opportunities in each of our departments. A highlight of the day for many was the tours of engineering laboratories and facilities. The following laboratories were open to provide informative tours for our guests:

- ◆ Advanced Materials Lab – Dr. Khaled Morsi
- ◆ Design and Modeling Lab – Mr. Tom Johnston
- ◆ Fabrication/Manufacturing Lab – Mr. Michael Lester
- ◆ Aerospace Lab – Mr. Stig Johansson
- ◆ Computational and Fluid Dynamics/Aeroelasticity Lab – Drs. Luciano Demasi & Gus Jacobs
- ◆ Structures Lab – Dr. Rob Dowell
- ◆ Soil Erosion Lab – Dr. Ed Beighley
- ◆ Environmental Lab – Dr. Temesgen Garoma
- ◆ Electrical & Computer Projects Lab – Mr. John Kennedy
- ◆ Antenna Lab – Dr. Satish Sharma
- ◆ Telerobotics Demonstration – Dr. Chris Paolini

4/22	Dean Hayhurst is the keynote speaker at the Federal Sector Agency Symposium.
4/22	Dean Hayhurst will attend the "Sustaining the World of Tomorrow" Reception with Jerome Ringo the President of the Apollo Alliance and Social Justice Advocate.
4/27	Dean Hayhurst will attend the retirement party for Stig Johansson.
4/28	Dean Hayhurst will meet with Rear Admiral French and his affiliates, Commander, Navy Region Southwest and Group.

Mr. Larry Hinkle, the Assistant Dean of Student Affairs and organizer of the event said "the day was well-structured, organized, and ran like clockwork." Thanks is clearly due to all the organizers and participants in the College who worked hard to make the day a success.



2010 Kyoto Prize Symposium
 By Dr. Isamu Akasaki,
 Pioneer of Blue LED Technology
 Thurs. April 22

Blue LED technology has brought us Blu-ray movies, stunning light displays and ecofriendly lighting. Once considered to be technologically impossible, the development of blue LED became a reality thanks to one man's breakthrough discovery. Dr. Isamu Akasaki is the 2009 recipient of the Kyoto Prize in Advanced Technology—Japan's highest private award for global



achievement—and he is considered to be the pioneer of blue LED technology. His extraordinary achievement stimulated research on blue LEDs worldwide and was the first step toward their eventual commercialization in the 1990s. Akasaki will speak about his lifetime contributions to semiconductor science during a special presentation at 10 a.m. on Thursday, April 22, at San Diego State University's

Dr. Kee Moon Named to SDSU Top 25



Dr. Kee Moon, Associate Professor of Mechanical Engineering, has received a Top 25 Award from President Weber. The Top 25 Awards were started 15 years ago by President Weber and his wife Susan, and are designed to celebrate extraordinary contributions of faculty, staff, students, alumni and community members to the university. Individuals selected for this prestigious award are judged to have accomplished transformational work which advances the university as a whole and reflects on the entire university.

Dr. Moon joined SDSU's faculty in 2005. In receiving this award, Dr Moon is being recognized for his novel inventions, his efforts in working with local industry to help students better anticipate and manage real world design challenges, and for facilitating an agreement between the Department of Mechanical Engineering of Kyung Hee University in S. Korea and the SDSU Mechanical Engineering to promote academic cooperation and exchange.

In 2009, Dr. Moon was the lead inventor of "Organic Photovoltaic Cell and Light Emitting Diode with an Array of 3-Dimensionally Fabricated Electrodes" (along with Drs. Morsi and Kassegne). It is an innovative manufacturing technology for making novel 3D organic light emitting diodes (OLED). The technology, which can lead to significant increase in efficiency and productivity, was recently patented and successfully licensed by AMO Co. Ltd. Dr. Moon is also the co-inventor of "Current Activated Tip-Based Sintering (CATS)". CATS is an innovative process for 1D, 2D, and 3D micro- and nano-scale powder-based fabrication. This processing technique has a wide range of applications in manufacturing of micro/nano sensors and actuators, micro/nano filters and Micro-Electro-Mechanical Systems (MEMS). In spring 2009, with cooperation from AutosplICE, Inc., he developed a ongoing design competition as a part of the course ME 310 (Engineering Design: Introduction) to help students better anticipate and manage real world design challenges. AutosplICE, Inc. provides a \$4,000 check to the winning team.

Student Research Symposium Awards for Engineering

SDSU's third annual Student Research Symposium was held March and 6 as part of this year's SDSU Month, an annual celebration during March of the university's dynamic and enriching relationship with the San Diego Community. Awards at the



Montezuma Hall. Joining him is Edgar Tu, Senior Vice President of Sony Electronics, who will discuss the commercial impact of Akasaki's work over the past twenty years, with demonstrations of an LED-backlit HDTV and a Blu-ray Disc player, plus a 3-D TV that will use Blu-ray technology. The Illuminating Engineering Society of San Diego will also create blue LED light installations throughout the building to enhance the lecture. For more information and to register for the presentation, please visit <http://www.kyotoprize.org/events/>

D.G. Faulkner Scholarship Announced

The AIAA San Diego Section has announced the creation of the D. G. Faulkner Scholarship for Aerospace Engineering juniors and seniors. The award was made possible by a donation from Doris Faulkner, in memory of Capt. (Ret.) Doc George Faulkner, who passed away on October 5, 2009. After a career as naval officer and pilot, naval engineer, and faculty member at the U. S. Naval Academy, George joined the Department of Aerospace Engineering at SDSU as a lecturer in 1978. During his 14 years at SDSU, George taught the capstone course in airplane design and served as the faculty advisor for the AIAA Student Branch, which included advising the first place team in the AIAA International Design, Build and Fly competition. In addition, George was selected several times for the Outstanding Faculty Award. After his retirement in 1992, George stayed on as a faculty advisor on a voluntary basis. In 2009 he received the AIAA San Diego Lifetime Achievement Award.

Symposium recognize the most outstanding presentations of research, scholarship, and creative activity. Five students from the College of Engineering were award recipients this year:

President's Award (\$500)

Steven Ruther, a master's student in Mechanical Engineering, for his project entitled, "Radiation Heat Transfer Simulation of a Small Particle Solar Receiver Using the Monte Carlo Method." Advisor: Fletcher Miller. Steven, along with the other President's Award recipients, will represent SDSU at the CSU Student Research Competition on April 30 and May 1 which is being held this year at San Jose State University.

Dean's Award (\$250)

Kyle Kitzmiller, a master's student in Mechanical Engineering, for his presentation, "Thermodynamic Cycles for Small Particle Heat Exchange Receivers Used in Concentrating Solar Power Plants." Advisor: Fletcher Miller.



Robert Moody, a master's student Electrical Engineering, for his presentation, "Investigations on Co-Planar Waveguide Fed Pentagon Shaped Planar Monopole Ultra-Wide Bandwidth Antenna Providing Invariant Radiation Patterns." Advisor: Satish Sharma.

Muhammad Navaid, a master's student in Aerospace Engineering, for his presentation, "Assessing the Trade-Off between Model Fidelity and Data Insufficiency in Selection of Composite Material Failure Criteria". Advisor: Satchi Venkataraman.

Provost's Award (\$150)

Ahmed El Desouky, a doctoral student in Engineering Science/Applied Mechanics, for his poster presentation entitled, "Current Activated Tip-Based Sintering (CATS)." Advisor: Khaled Morsi.

The Student Research Symposium provides an opportunity for undergraduate, master's and doctoral students to present their research on a variety of topics in poster and oral presentations. According to SRS organizers, there was a 42 percent increase in participants this year as compared with the first symposium in 2008.

As SDSU President Stephen Weber stated in the program's opening remarks, "The symposium provides a venue for sharing academic excellence and discovery, and it demonstrates SDSU's commitment to developing innovative solutions for our region, nation, and the world. All of these goals advance the vision of SDSU as a top urban research university."

During the CSU Student Research Competition at San Jose State University, cash awards will be provided to the outstanding presenter and the runner-up in both the undergraduate and graduate divisions of each category of presentation. Good luck to the College of Engineering's Steven Ruther and the nine other students representing SDSU that weekend!

German & Olevsky Awarded Prestigious DARPA Funding

Dr. Eugene Olevsky, Distinguished Professor of Mechanical Engineering and Director of SDSU's Powder Technology Laboratory, and Dr. Rand German, Associate Dean,



have received a \$300,000 grant from DARPA (Defense Advanced Research Projects Agency) to work toward gaining a fundamental understanding of the physics behind the processes of spark-plasma sintering. Dr. German describes the research as "Coming up with a fundamental understanding of what's going on with this



Faculty and staff are invited to submit stories, story ideas and photos to be included in this newsletter. Please contact Cindi at cmclain@mail.sdsu.edu or 4-6062

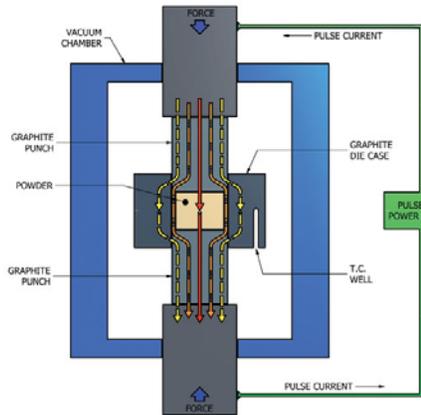


...interesting new way of consolidating materials.



The research funded by this grant is the first phase of what will hopefully become a long-term effort to better understand the process of spark-plasma sintering, and will open the door for further advances in this field. One of the advances that Olevsky and German envision is the creation of a tough ceramic armor—one that requires more energy to fracture than current materials.

And remember the transparent aluminum used in Star Trek? Drs. Olevsky and German foresee being able to someday replicate this material. Both the concepts of tough ceramic armor and light-weight, transparent aluminum are of great interest to DARPA for military applications.



The grant, awarded in March, will support the first phase of research set to begin in early April. The funding will provide support for master's and doctoral students as well. Drs. Olevsky and German worked for roughly a year to respond to DARPA's Broad Agency Announcement, communicated with DARPA program directors, and put together a formal full-scale proposal.

DARPA differs from other funding agencies in that it looks for projects that aim towards a higher goal of truly helping to make a difference in their field and opening doors for new developments. DARPA's mission is to maintain technological superiority of the U.S. military and prevent technological surprise from harming our national security.

Efforts are also being made towards industrial collaboration with companies, particularly those interested in pushing the limits on military-type materials,

Research Corner—Projects Submitted & Awards Granted in February

<u>Name</u>	<u>Dept</u>	<u>Title of Project</u>	<u>FA</u>	<u>Status</u>
Dr. Subrata Bhattacharjee, Dr. Fletcher Miller, Dr. Christopher Paolini	ME	Residence Time Driven Flame Spread Over Solid Fuels	NASA	Awarded
Dr. Luciano Demasi	AE/EM	Computationally Efficient Nonlinear Multi-Theory Analysis of Structures and Aeroelastic Problems	NSF	Submitted
Dr. Robert Dowell, Dr. Edward Beighley	CCEE	Time Dependent Deflection of In-Span Hinges of Prestressed Concrete Bridge Structures During Construction	CA DOT	Submitted
Dr. Temesgen Garoma	CCEE	Seawater Desalination Using Capacitive Deionization Technology	SD Fdn. for Change	Submitted
Dr. Temesgen Garoma	CCEE	Significance of Sub-Therapeutic Levels of Ciprofloxacin in the Environment	SD Fdn. for Change	Submitted
Dr. Gustaaf Jacobs	AE/EM	Collaborative Proposal: Higher-order Two-fluid Methods for Simulations of Particle-laden Flow	NSF	Submitted
Dr. Gustaaf Jacobs	AE/EM	Aerodynamic Assessment of High Speed Sled in Dual Slot Guideway	General Atomics	Submitted & 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-AF OSR	Awarded
Dr. Sunil Kumar	ECE	Robust H.264 Video Packetization and Prototype of Video Streaming in Multi-hop Airborne Wireless Networks	DOD-AF Res. Lab.	Awarded
Dr. Karen May-Newman	ME	Bubble Mechanics Study	Preventiv Inc.	Submitted
Dr. Fletcher Miller	ME	Hybrid Solar Micro-concentrator Technology Applied for Trigeneration	Chromasun, Inc.	Submitted
Dr. Kee Moon	MF	Engineering Research Center for Sensorimotor Neural Engineering	U of WA	Submitted

Dr. Eugene Olevsky, Dr. Randall German	ME	Fundamental Aspects of Spark-plasma Sintering	DOD-ONR	Submitted
Dr. Mahasweta Sarkar, Dr. Christopher Paolini	ECE	NeTS: Small: Redefining QoS in 802.11e- A Survival Strategy for the "Underdog" Traffic	NSF	Submitted
Dr. Mahasweta Sarkar, Dr. Christopher Paolini, Dr. Santosh Nagaraj	ECE	IHCS: Designing and Prototyping a Location Aware "Smart Badge" for Automated Networking	NSF	Submitted
Dr. Satish Sharma	ECE	Novel Compact Wideband Volumetric Metamaterial (MM) Structures for Antennas with Enhanced Radiation Performance	DOD-ARPA	Submitted

Research Corner—Projects Submitted & Awards Granted in March

Dr. Edward Beighley	CCEE	Channel Routing for the Mackenzie River Basin	DOE-Los Alamos	Awarded
Dr. Asfaw Beyene	ME	IAC Coronado Naval Base - North Island	UT-Battelle	Awarded
Dr. Temesgen Garoma	CCEE	BRIGE: Activity and Biodegradability of Pre-Oxidized Bisphenol A	NSF	Submitted
Dr. Temesgen Garoma	CCEE	Desalination of Seawater by Deionization Technology	WateReuse Fdn.	Submitted
Dr. David Hayhurst	DNS	CODE - SERVICE (Success in Engineering for Recent Veterans Through Internship and Career Experience) Program	CODE Org.	Submitted
Dr. Sunil Kumar	ECE	Cross-layer Design for Robust and Scalable Video Transmission in Dynamic Wireless Environments	DOD-AF Res. Lab	Submitted & Awarded
Dr. Sunil Kumar	ECE	Performance Analysis of Google Wave Technology	Sentek Global Inc.	Submitted
Dr. Fletcher Miller	ME	Flameless Oxidation in the Presence of Carbon Particles and Concentrated Radiation	NSF	Submitted
Dr. Eugene Olevsky, Dr. Randall German	ME	Fundamental Aspects of Spark-plasma Sintering	DOD-ONR	Awarded
Dr. Yusuf Ozturk	ECE	Motorola Pervasive and Ambient Computing Summer School	Motorola Fdn.	Submitted
Dr. Satish Sharma	ECE	Wideband Metamaterial Antennas Integrated into Composite Structures	NextGen Aeronautics	Submitted

CA DOT = California Department of Transportation
DOD AF-OSR = Dept. of Defense Air Force Office of Scientific Research
DOD ONR = Dept. of Defense Office of Naval Research
DOD ARPA = Dept. of Defense Advanced Research Projects Agency
DOD USN = Department of Defense/United States Navy