

# COLLEGE OF ENGINEERING san diego state university

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# AEROSPACE ENGINEERING

## First HyperSizer/AIAA Structures Best Paper Award



Joined-wing configurations are a new type of aircraft which could, in prospect, revolutionize the air transport system. Among others, these configurations introduce advantages in terms of lower induced drag (one of the major components of the total drag) and consequently, a reduction of the fuel consumption and noxious emissions. Joined-wing aircrafts have then the possibility to represent the ideal solution for sustainable and efficient future transport systems.

SDSU's Aerospace Engineering team led by Dr. Luciano Demasi made several contributions on these exciting topics in their technical paper, "Nonlinear Analysis of PrandtlPlane Joined Wings. Part II: Effects of Anisotropy." This paper has been selected to receive the first HyperSizer/AIAA Structures Best Paper Award. The research team in the Aerospace Engineering department is trying to achieve an understanding of the main mechanisms that drive the instabilities of joined wings so that a cost-effective design methodology could be introduced for the future of aviation industry. The research efforts of Dr. Luciano Demasi and his team have not only been recognized at SDSU but also internationally.

## SDSU Places 2nd in the 17th Annual AIAA Design Build and Fly Competition

NEWSLETTER SPRING 2013

Congratulations to SDSU's aerospace engineering students, as they have finished 2nd (among 81 teams from the US and international universities) in the 2013 AIAA Design Build and Fly competition.

The AIAA through the Applied Aerodynamics, Aircraft Design, Design Engineering and Flight Test Technical Committees and the AIAA Foundation invited all university students to participate in the Cessna/Raytheon Missile Systems Student Design/ Build/Fly competition. The contest provided a real-world aircraft design experience for engineering students by giving them the opportunity to validate their analytic studies.

Student teams were tasked with designing, fabricating, and demonstrating the flight capabilities of an unmanned, electric powered, radio controlled aircraft which can best meet the specified mission profile. The goal was to balance design possessing good demonstrated flight handling qualities and practical and affordable manufacturing requirements while providing a high vehicle performance.

The following SDSU Aerospace students should be recognized:

- Jeromey Suko
  (Team Manager)
- Steve Micallef
- Max Robertson
- Edward Sanchez
- Jerry Ngo
- David Moore

- Adrian Diosdado
- Daniel Marten
- Brett Sens
- Isa Aguilar
- Ramon Guerra
- Paul de Guzman

# ELECTRICAL ENGINEERING

## **Professor Gupta Becomes the President of an IEEE Society**



Congratulations to SDSU's Electrical Engineering professor Madhu Gupta for becoming the new President of the IEEE Microwave Theory & Techniques Society for 2013. IEEE is the world's largest scientific, technical, or professional society, with over 400,000 members in over 140 countries. It is made up of 38 Societies, each representing a technical sub-discipline within the overall field of electrical and computer engineering. The Microwave Theory & Techniques Society (MTT-S) is the fifth largest of the IEEE Societies, with over 12,000 members world-wide, and celebrated its 60th anniversary last year. Professor Gupta is the 61st President of the Society, and assumed the office at the beginning of 2013.

Madhu Gupta has been a Professor in the SDSU Department of Electrical and Computer Engineering, and holds the RF Communication Systems Industry Chair in that department, since 2000. He is also concurrently the Director of the SDSU Communications Systems and Signal Processing Institute, and an Adjunct Professor of Electrical & Computer Engineering at University of California, San Diego. His field of specialization is in low-noise microwave technology, and its applications in wireless communications. He has served as the Editor-in-Chief of two different journals published by the IEEE MTT Society, and has received the Distinguished Microwave Educator Award from that Society in 2008. He also received the SDSU Monty award in 2004, and the Northrup Grumman Award for Teaching Excellence from SDSU College of Engineering in 2004.

When asked what motivates him to do this enormous amount of service work, Dr. Gupta replied that he feels a sense of responsibility and commitment towards the profession from which he has benefitted and drawn over his entire career, and wants to "put something back in the kitty." He is also excited about directing the technical activities of the world's most prestigious society in his field at a time of explosive growth in its applications in the service of mankind.

#### SDSU's NECA Ready for the Green Energy Challenge

SDSU's National Electrical Contractors Association (NECA) will be heading to the 5th annual EI/NECA Student Chapter Competition, the third of which SDSU will be participating. This year's focus will be a Green Energy Challenge. There are three primary goals for this competition: Create an annual event that will engage NECA Student Chapters members in a rewarding educational experience in electrical and energy services contracting. Challenge student chapter teams to develop technical skills vital to careers in electrical construction and professional skills in time management, oral and written communication. Lastly, provide a mechanism for NECA Student Chapters to create interest in chapter membership and in careers in electrical construction at their university. In addition to these goals the competition encourages coordination and teamwork from different aspects of engineering. The teams can have an array of concentrations (mechanical, electrical, environmental, and other engineering fields). By combining students from different fields of engineering the competition becomes even more life-like. The professional world is a composition of several different fields, business, engineering, accounting, medical, etc. The competition teaches you how to successfully work together as a team and create the best end product.

At last year's competition in March, SDSU's NECA team placed 6th out of 18 teams. This year's competition will be to renovate an existing parking structure. The team will be analyzing the mechanical, lighting, structural (for potential PV use), general electrical and several other components of the structure and combine all the idea into one final proposal. Let's send them well-wishes for their upcoming competition in May 2013 as they represent SDSU. Go Aztecs!

# MECHANICAL ENGINEERING

## Climate Change Makeover, Using a Different Model for Climate Change

Professor Asfaw Beyene of the Department of Mechanical Engineering at San Diego State University, along with engineer Ron Zevenhoven of the Thermal and Flow Engineering Laboratory, at Abo Akademi University in Finland, have now proposed a new notion of global thermodynamics in the wake of rising atmospheric carbon dioxide levels. They suggest that it is time for a makeover and that rather than focusing on temperature, we should also now consider the many other factors involved in climate change- air pressure, wind speed, and humidity etc.

The team has introduced the concept of "Equivalent Rate of Evaporation" (ERE), which they say provides better estimates of how enthalpy of vaporization affects climate change. "This approach offers a more lucid understanding of the climate model, with indubitably more accurate results," the team says. The researchers point out that the earliest models of climate change did not distinguish between vertical and horizontal energy or include a temperature stratification. Later, models took this into account but this led to there being two parallel modeling systems, which the researchers suggest widens the error bars on predictions.

Including factors such as wind, pressure, humidity as well as temperature change will feed into a new model with tighter error bars, a reduction in secondary modeling artifacts, and a better chance of predicting global warming and thence climate change. This would not be so much a makeover as a much-needed complete overhaul of climate science.

## ZAHN CENTER

#### Zahn Center's Gregg Anderson Launches Jobioz, Inc.

The Zahn Center for Technological Innovation is an incubator that supports San Diego State University innovators and aspiring entrepreneurs—students, faculty and staff from any department on campus—as they transform their ideas into companies.

Gregg Anderson, co-founder of Jobioz, Inc, started off as an aspiring entrepreneur with an idea that he transformed into a business. Jobioz, Inc is an SaaS cloud-based platform that will help college students find internships and entry-level jobs. Jobioz aims to revolutionize the hiring process for graduating students, increasing efficiency, reducing costs, and providing an all-in-one job hunting and online recruiting platform. Their overall mission is to connect students to careers by providing a service that will help students create a digital resume with features such as: a multimedia gallery, project builder, and testimonials so that potential employers will

see their true value. Students can create a profile, search for jobs and track the hiring process. Recruiters can post jobs, search student profiles, save favorites, and conduct interviews online with the use of a CRM tool.

The Zahn Center will be working with Gregg Anderson to prepare for a beta launch of Jobioz, Inc. at San Diego State University. The Zahn center will also help create a road map for Mr. Anderson that helps with business support, financing, and physical space for the launch of his new business. With accelerated help from SDSU's Zahn Center, Jobioz Inc. will be able to eventually launch into an independent company.

# SERVICE

#### Veterans Program Receives National Recognition

SDSU's College of Engineering is becoming more and more successful every year, especially when it comes to Veterans and Engineering. SDSU's College of Engineering is proud to have the most recognized Troops to Engineering Program in the country. The program, created by College of Engineering's Dr. Patricia Reily, has been very successful and continues to receive lots of positive publicity. On February 3, 2013, the Troops to Engineering Program was mentioned in the NY Times and was named "one of the earliest and most extensive college programs, including special mentoring for engineering majors, and veteran-only classes".

In addition to the great successes of the program, the Troops to Engineers SERVICE Program was recently awarded a \$600,000 grant over the course of three years to supply student veteran as interns to support the Office of Naval Research (ONR) Energy Systems Technology Evaluation Program (ESTEP) Projects. ESTEP Projects will explore how to reduce energy costs and increase energy security at the Department of the Navy (DON) facilities by accelerating the introduction and adoption of advanced energy systems and equipment. ESTEP Projects have been approved at Space and Warfare Systems Command (SPAWAR), Naval Facilities Engineering Command (NAVFAC), and the Navy Post Graduate School (NPS). ESTEP will be another way to give our student veterans and Wounded Warriors in Engineering hands-on experience that will enhance their classroom experiences.

Click to view entire NY Times article.

# MESA/MEP

#### MESA Engineering Program Celebrates 30 Years

The MESA Engineering Program (MEP) at SDSU's College of Engineering is proud to be celebrating its 30th anniversary. MESA (Mathematics, Engineering Science Achievement), nationally recognized for its innovative academic development program, helps develop the STEM workforce that California and the U.S. needs by increasing rates of college eligibility, transfer and degree completion. The program offers academic support to students with interest in STEM (Science, Technology, Engineering, Mathematics) who are first in their families to attend college, are low-income, and/or attended low-performing schools with few resources. MESA assistance is available along the entire academic pathway including K-12, community college and university levels. MEP was established at SDSU in 1982 to serve university level engineering students. In 1991, Maximizing Science Potential (MSP) began serving physical science students. A 30 year history of graduating talented, diverse students who become business owners, earn PhDs, and contribute to the STEM workforce leaves a legacy of success.

SDSU's MEP 30th Anniversary Banquet will be held on May 16, 2013 at SDSU's Parma Payne Goodall Alumni Center. For more information, contact SDSU MEP Director, Theresa Garcia at 619-594-5679 or tgarcia@mail.sdsu.edu

## **MESA WORKS!**

#### **MEP Students are:**

% 46

First Generation College Students

From Low Income Families

86.4<sup>% Ethnic</sup>

%

Minority

## MEP:

Graduated over 900 **Engineering & Physical** Science Majors in the last 30 years

Won - 2001 Innovations in American Government Award

#### Green Grant for MESA Program

Hats off to the MESA Alliance Green Academy for receiving a \$30,000 Green Future Grant funded by San Diego Gas & Electric (SDG&E). MESA's Green Academy is a model "train-the-trainer" academy for understanding what is energy efficiency and sustainability. The Green Academy will provide hands-on training in energy efficiency and sustainability to 30 high school, community college, and university students in the MESA pipeline (high schools with MESA Schools Programs in San Diego and Imperial Valley, and MESA programs at San Diego City College, Southwestern College, and San Diego State University).

In addition to receiving hands on training and a training packet, the trainees will be exposed to energy efficiency and to green careers at San Diego Gas & Electric. The Green Academy is developed, organized, and implemented by two MESA staff, in collaboration with the San Diego State University PowerSave Green Campus. The goal of the Green Academy is to prepare the trainees to deliver presentations on energy efficiency and sustainability to their peers at their respective institutions. Through these school presentations, the Green Academy outreach is expected to impact over 1,000 students from kindergarten through the college level.

In addition, the training packet developed will be available online to facilitate regional and national dissemination for replication.

This "train-the-trainer" model was successfully piloted by the San Diego MESA Alliance in the summer of 2012 as a research academy to enable students to see a clear pathway to research and the field of aerospace engineering. The goal for the Green Academy will be for the trainees, as well as the impacted audience, to develop goals for career pathways in energy efficiency and sustainability.

# San Diego State University

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