Summer 2013

# Engineering News, Summer 2013

School of Engineering

engineering news
School of Engineering
SUMMER 13
SANTA CLARA UNIVERSITY

## DEAN'S MESSAGE

Welcome to the first summer edition of *Engineering News*. Departing from our usual format, we hope to provide you with a snapshot of who we are and what we do.

At SCU, we are *Engineering with a Mission*. More than just a tagline, these words epitomize what we are all about. At the heart of our campus sits Mission Santa Clara de Asís, the eighth Spanish mission built in California in the 18th century. Today, as a lively and nurturing gathering place for our diverse University community, the Mission serves as a physical reminder of our Jesuit, Catholic tradition of educating the whole person and of our empirical mission to inspire and develop engineering leaders to build a more just, humane, and sustainable world.

A rigorous academic program that pairs theory with hands-on projects, strong core curricula at both the undergraduate and graduate levels that develops left and right brain thinking, and a values-based learning environment are some of the elements that draw this unique community to Santa Clara. This is a place where students want to learn, to do, to be a part of something bigger than themselves. This is a place where faculty love to teach, to help students develop their individual potential, and to provide seemingly unlimited opportunities for fulfillment.

You will find a brief glimpse of us in these pages. For a more comprehensive view, please visit: www.scu.edu/engineering.

Godfrey Mungal
*Dean*
*School of Engineering*

Photo: Adam Hays


*Santa Clara University's undergraduate team is ready to compete.*

## Solar Decathlon—One BIG Project!

For the third time, Santa Clara University has been selected to participate in the U.S. Department of Energy's international Solar Decathlon, a competition through which collegiate teams are challenged to design, build, and operate the most attractive, cost-effective, and energy-efficient houses. With the end goal of inspiring consumers to open their minds to solar energy, these 20 homes will be lined up on display in a solar village October 3–13 in Irvine, California.

No longer the new kids on the block, Santa Clara has competed twice before, taking 3rd place, overall, in both 2007 and 2009 against engineering heavyweights such as Cornell, Carnegie Mellon, MIT, Penn State, and Virginia Tech.

The Solar Decathlon is situated exactly in our "sweet spot" at the intersection between academics, sustainability, and social justice. It is an example of the type of hands-on, project-driven experiences SCU engineering is known for providing our students. But this is one exceptionally BIG project, even by Santa Clara standards!

Advised by faculty, our undergraduate students are given complete responsibility for all aspects of the two-year venture—everything from the design of photovoltaic, plumbing, and control systems to fundraising and marketing. This year the team even has two resident student ethicists on board who help identify and evaluate social and moral concerns as they arise.

Through their participation, students hone their engineering, construction, communication, and problem-solving skills, master ways in which to manage the myriad tasks comprising the gargantuan project, learn to work successfully with teammates, build confidence, and share their passion for sustainable, energy-efficient design with thousands (if not millions) of others.

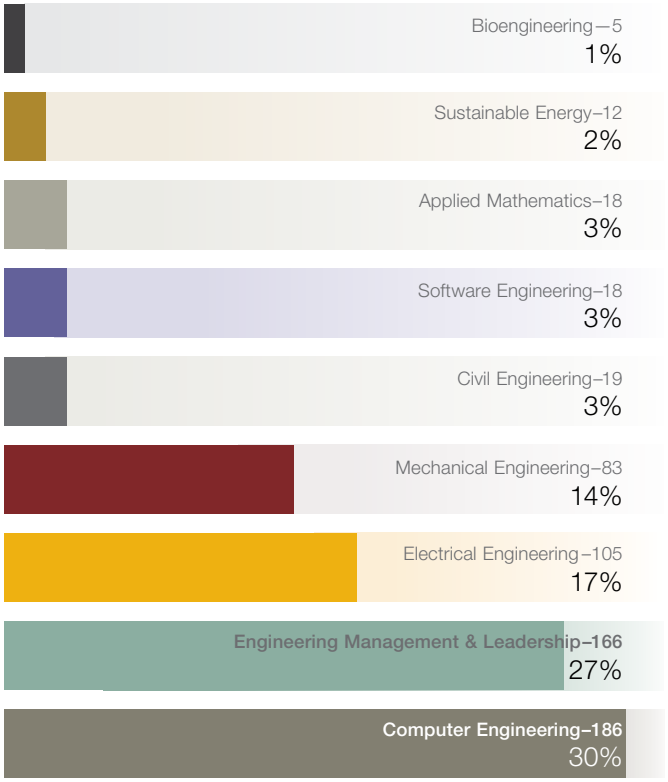
### SCU Solar Decathlon at a Glance

- Interdisciplinary team
- 13 subteams; 100 + students
- 1,000 sq. ft. solar powered home designed and built by undergraduates
- Introducing new bamboo structural technologies developed at SCU

## Undergraduate Enrollment 2013

| Major | Students | Percentage |
|---|---|---|
| BioE | 158 | 18% |
| Civil | 129 | 15% |
| Computer | 167 | 20% |
| Electrical | 79 | 9% |
| General | 5 | 1% |
| Mechanical | 236 | 28% |
| Web Design | 34 | 4% |
| Undecided | 42 | 5% |
| **Total** | **850** | **100%** |

## Graduate Enrollment 2013




**Total—612* 100%**

**does not include 86 certificate and open university students*

## 2013 Degrees Conferred—471

B.S. – 167

Engineer's Degree – 1

M.S. – 297

Ph.D. – 6

## SCU Engineering at the Forefront

Santa Clara University is at the forefront of shaping the new paradigm of frugal innovation, a process of problem solving that addresses the need for accessible, affordable, adaptable, and appropriate technologies, products, and services for emerging, underdeveloped countries.

**FrugalInnovationLab**
SANTA CLARA UNIVERSITY SCHOOL OF ENGINEERING

**Instruction** – undergraduate and graduate courses; collaboration with the Leavey School of Business, College of Arts & Sciences, Markkula Center for Applied Ethics

**Innovation** – devices to improve global health, mobile apps, international corporate partnerships

**Immersion** – GSBI (Global Social Benefit Incubator) Fellowships, internships with social enterprises, 22 ongoing projects in 6 disciplines with field enterprises worldwide

## Ph.D. Students by Department

**AY 2012–2013**
*(50 Total below reflects currently enrolled students only.)*

### Mechanical
**9**

### Electrical
**18**

### Computer Engineering
**23**

## Engineering by the Numbers

**1** Santa Clara University (formerly Santa Clara College) was the first operating institution of higher learning in California

**7** departments within the School of Engineering:

- Applied Mathematics
- Bioengineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Engineering Management and Leadership
- Mechanical Engineering

**10** Latimer Energy Scholars: A select group of undergraduate students who have identified themselves as holding a strong interest in learning about sustainable energy systems and graduate students who act as mentors. Starting as freshmen, students improve their expertise through the four or more years they are enrolled at SCU. They study the fundamentals of sustainable energy and carry out practical, hands-on projects of increasing sophistication. Much of their work is self-guided, allowing them to follow their passion. Supported by a $1.3 million donation.

**11** faculty research groups from 6 departments within the School of Engineering and College of Arts & Sciences utilizing the Center for Nanostructures

**22** Frugal Innovation Lab ongoing projects (40–50 projected for 2013–14)

**24** percentage of female undergraduate engineering students

**30** students from the Robotics Systems Laboratory and marine operations classes participated in Tahoe-Palooza: 5 days of robotic operations in Lake Tahoe with a student-developed underwater intervention robot, an autonomous bathymetric mapping boat, and a small fleet of robotic kayaks; scientific operations were conducted in cooperation with geologists from the University of Nevada at Reno and the U.S. Geological Survey.

**32** engineering degree programs offered to undergraduate and graduate students

**42** full-time engineering professors

**52** Senior Design projects completed by teams of students in 2013

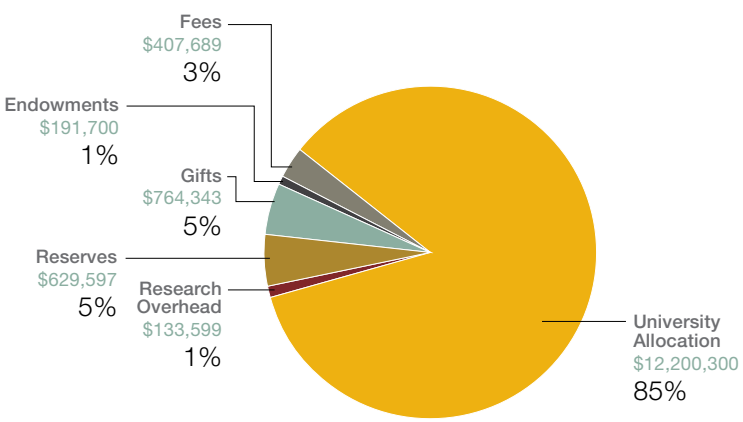
**75** part-time faculty members from Silicon Valley are employed by SCU Graduate Engineering to maintain a strong industry connection.

**101** years of excellence in engineering education at SCU

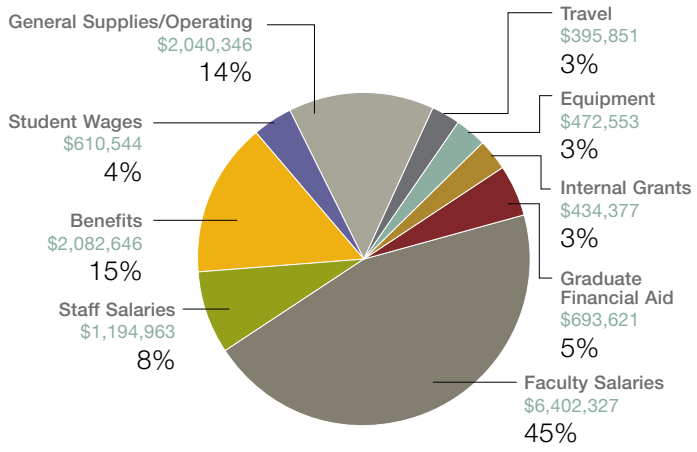
**450+** years of Jesuit tradition

## Revenue and Expenses

### FY 2011–2012 Revenue Sources — $14,327,228




### FY 2011–2012 Expense Categories — $14,327,228



## Faculty Global Influence

**6** books and book chapters

**22** countries* visited (2012–13) for presentations, conferences, collaboration, visiting professorships, etc.

**34** journal articles

**74** conference proceedings

*Australia, Canada, China, Ghana, Honduras, Hungary, India, Korea, Netherlands, New Zealand, Nicaragua, Peru, Poland, Portugal, Qatar, Singapore, Spain, Sweden, Switzerland, Taiwan, United States of America, Uruguay*

## Where They Work

**Top employers of SCU engineering graduates 2002–12** *(source: LinkedIn)*

- Cisco Systems
- Lockheed Martin Space Systems Co.
- Apple
- Intel Corporation
- Space Systems Loral
- Lockheed Martin
- Oracle
- Broadcom
- Texas Instruments
- Xilinx
- Google
- Applied Materials
- Hewlett-Packard
- Yahoo!
- KLA-Tencor
- Symantec

## Post-Graduation Employment Status

**Six months after graduation, engineers from the Class of 2012 were surveyed**

**82** percent of engineering respondents reported that they are employed full time.

**97** percent of the engineering respondents reported that they received fair to excellent preparation for success in their careers.

## Alumni Achievement

**Robin Senigaglia Beck** '77, as JPL Cognizant Engineer, helped Curiosity Rover land safely on Mars.

**Steve Hageman** '78 received *EDN/EE Times*' Creativity in Electronics Award.

**10 alumni and faculty** members have been named to the Silicon Valley Engineering Hall of Fame.

**Among our alumni** we also count members of the National Academy of Engineering and National Inventors Hall of Fame; founders, presidents, and CEOs of thriving Silicon Valley tech companies and Fortune 500 firms; a former dean of engineering at CalPoly; a former vice president of Nicaragua, doctors, attorneys, city planners, Peace Corps workers, venture capitalists, and the list goes on.

Santa Clara University
School of Engineering

Santa Clara University
500 El Camino Real
Santa Clara, CA 95053

The Jesuit University in Silicon Valley

Engineering News is published quarterly by the School of Engineering, Santa Clara University, Santa Clara, Calif.
• Writer and Editor: Heidi Williams, hwilliams@scu.edu
• Creative Director: Linda Degastaldi-Ortiz
• Copy Editor: Dona LeyVa

SCU OMC-8072K 8/2013 1,500