Register today and be a part of this event that gives colleagues and industry partners like you insight and access to our groundbreaking research and the world-class minds driving it.

**Research Review Day**

*Join us on Thursday, October 21, 2010*

**Four reasons you should attend**

1. **Glimpse the leading edge**
   - Attend presentations on exciting research in Biotechnology, Energy, and Human Centered Design.

2. **Tap into research support for your organization**
   - Meet faculty and learn how UCSC research can advance your company’s goals through partnerships and collaborations.

3. **Discover premier talent**
   - Meet our top M.S. and Ph.D. engineering students and discuss their groundbreaking work.

4. **Stay informed**
   - Meet technology leaders, researchers, and faculty who are dynamically changing the technology landscape in Silicon Valley.

**SCHEDULE**

- **9 TO 9:30 AM**
  - Registration and coffee
- **9:30 TO 10:15 AM**
  - **PLENARY TALK**
  - Energy
  - Jonathan Trent
  - OMEGA Project Scientist, Bioengineering Branch, NASA Ames Research Center
  - Beyond Petroleum: The OMEGA revolution
  - We stand on the threshold of a revolution that will transform civilization from hunting and gathering our energy to cultivating sustainable, carbon-neutral, energy crops. We will describe OMEGA (Offshore Membrane Enclosures for Growing Algae) and the emergence of technology ecology.
- **10:30 AM TO 3 PM**
  - Faculty Research Presentation
- **NOON TO 12:45 PM**
  - Lunch (pizza)
- **12:45 TO 1:30 PM**
  - **PLENARY TALK**
  - Human Centered Design
  - David Yager
  - Dean, Arts Division, UC Santa Cruz
  - User Centric or Me Centric Design/Crowdsourcing
  - Good Design is better than Good Looking Design
- **3:15 TO 4 PM**
  - **PLENARY TALK**
  - Biotechnology
  - William Young
  - Venture Partner, Clarus Ventures
  - Genentech Biotech Manufacturing—Lessons from the early years
  - Discusses how Genentech became the premier company in the world in biotech process development and manufacturing that resulted in making life saving drugs available to patients.
- **4 TO 5 PM**
  - Poster session
  - w/light reception

**rr.soe.ucsc.edu/2010**
Welcome to the Jack Baskin School of Engineering.
The fields of engineering evolve over time but remain ever focused on solving hard, practical problems. Researchers at the Baskin School of Engineering work on a wide variety of such problems, bringing to bear cutting edge scientific and quantitative tools for their solutions. Our close proximity to Silicon Valley presents us with unique opportunities for industry interaction while our location on the Monterey Bay also shapes the way we define these problems.

You are invited to take part in Research Review Day to learn about the exciting advances taking place at the Baskin School of Engineering.

**Biotechnology**

**9:30 TO 10:15 AM**
Plenary Speaker Energy

**10:30 TO 11 AM**
Phil Berman Professor, Biomedical Engineering

**Immunology of HIV vaccine antigens**

The development of a vaccine that elicits broadly neutralizing antibodies (bNAbs) is a major goal of HIV vaccine research. Our results suggest that a two-step approach involving the production of mutant envelope proteins that expose neutralizing epitopes, coupled with mutations that preserve these sites from proteolysis, might result in improved vaccine antigens compared to those developed to date.

**11:15 TO 11:45 AM**
Ed Green Assistant Professor, Biomedical Engineering

**Using ancient genomes to understand recent human evolution**

We have recently completed a draft sequence of the Neandertal, our closest extinct relatives. Using these data allows a powerful, new approach to finding regions of our genome that experienced recent changes in our evolutionary history. In combination with diversity data from living humans, we have used the Neandertal genome to identify and understand the final genetic steps that occurred that made us fully modern humans.

**12:45 TO 1:30 PM**
Plenary Speaker Human Centered Design

**1:45 TO 2:15 PM**
Todd Lowe Associate Professor, Biomedical Engineering

**New Discoveries from Extremophile Genomes**

The study of extremophilic microbes enables the understanding of their core biology and the unique properties that make life possible in extreme environments. Via a mixture of next-generation DNA/RNA sequencing and bioinformatics, we have decoded new genotypes, studied gene regulation and genome evolution, and discovered thousands of new genes. Some of the surprises from our work will be presented.

**2:30 TO 3 PM**
Dejan Milutinovic Assistant Professor, Applied Mathematics and Statistics

**Cells and Robots: Stochasticity in Biology and Robotics**

Understanding the role which stochasticity plays in decision making in Biology provides not only directions for advancing complex robotic systems, but gives a better understanding of the computational basis of life. The interplay between Robotics and Biology is illustrated by an analysis of flow cytometry distributions and the intravital video microscopy of immune system cells, as well as a novel design in robotics.

**3:15 TO 4 PM**
Plenary Speaker Biotechnology

**Energy**

**9:30 TO 10:15 AM**
Plenary Speaker Energy

**10:30 TO 11 AM**
Joel Kuby Associate Professor, Electrical Engineering

**Renewable energy microgrid tested at NASA Ames Research Center**

This talk will review the development of a renewable energy microgrid at the NASA Ames Research Center that includes generation (solar and wind) and storage in an electrical vehicle. It is based on a student project that was initiated in the LoCall RE Renewable Energy in Practice Summer School held in Lolland, Denmark in 2008.

**11:15 TO 11:45 AM**
Sue Carter Professor, Physics

**Next Generation Photovoltaic Research at UCSC**

UCSC’s comprehensive research program on next generation photovoltaics, including nanocrystalline, organic, quantum dot, and solar concentrators, will be discussed with a focus on how such technologies can improve energy efficiency, reduce processing and materials costs, and facilitate building integration.

**1:45 TO 2:15 PM**
John Balachandra Adjunct Professor, Electrical Engineering

**Microgrids and Sustainability**

Microgrids are emerging as a technology due to the congestion in the electric grid. Issues of energy efficiency, power quality optimal utilization of generation resources within the microgrid will be explored.

**2:30 TO 3 PM**
Ali Shakouri Professor, Electrical Engineering

**Engaged Interdisciplinary Learning in Sustainability**

We describe a recent initiative to develop a curriculum in renewable energies and sustainability which involves close collaboration between faculty in Engineering and Social Sciences. Key ingredients are the students’ projects in collaboration with the local community and industry and the focus to develop technological solutions which consider social impact and adaptation.

**Human Centered Design**

**10:30 TO 11 AM**
Sri Kurniawan Assistant Professor, Computer Engineering

**Human-centered assistive technology**

Human-centered assistive technology enables systems that are playful, usable and aesthetically pleasing. Examples of a humming Tetris for people with combined motor and speech impairment, a series of iPhone games to motivate teenagers to exercise, and a mobile virtual speech therapist for older stroke survivors will be presented.

**11:15 TO 11:45 AM**
Noah Wardrip-Fruin Associate Professor, Computer Science

**User Centric or Me Centric Design/Crowdsourcing**

Plenary Speaker Biotechnology

**1:45 TO 2:15 PM**
James Davis Associate Professor, Computer Science

**The HPU: Human Processing Units**

Replacing individual procedures on a CPU, with calls to an HPU co-processor, allows the creation of software systems impossible on a CPU alone. We summarize our work characterizing HPUs, showing that they are better and cheaper than CPUs on some computer vision tasks. In addition, we discuss the demographics behind HPU users, showing the promise of HPUs as a tool for poverty remediation.

**2:30 TO 3 PM**
David Draper Professor, Applied Mathematics and Statistics

**Early detection of adverse medical events in the electronic medical record era**

The next ten years will see a revolution in medical informatics, with the widespread adoption of real-time electronic medical records. These new systems will replace paper based record keeping and will permit the adoption of a new generation of statistical algorithms to update estimated probabilities of adverse medical events in real time.

**Genentech Biotech Manufacturing—Lessons from the early years**

**1:45 TO 2:15 PM**
David Draper Professor, Applied Mathematics and Statistics

**Beyond Petroleum: The OMEGA revolution**

Human-centered assistive technology enables systems that are playful, usable and aesthetically pleasing. Examples of a humming Tetris for people with combined motor and speech impairment, a series of iPhone games to motivate teenagers to exercise, and a mobile virtual speech therapist for older stroke survivors will be presented.