

Innovative Research on Solar Cells Provides an Opportunity for a more Durable, Accessible, & Affordable Solar Panel

By: Karen Housel

Research Discoveries of UCSB Professor and Nobel Prize Laureate, Dr. Alan J. Heeger

The imagery of a solar cell might bring to mind the large, dark panels you see from time to time on rooftops. However, the cells that Dr. Alan Heeger is working on are not solar panels we are familiar with: they are thin, flexible, and can be displayed in a variety of colors. The sheer durability of the cell correlates with how the solar cell is made, for Heeger has found a way to make the materials of a solar cell soluble, which can be formulated as a liquid.

The liquid, which Heeger describes as a “liquid-ink” of solar cell material, could be printed from a roll-to-roll printing press, much like how newspaper is printed. The ability of printing solar cells allows people all over the world to print large area solar cells in abundance, at very low cost, which makes the manufacturing process of Heeger’s solar cell plausibly revolutionary.

These thin, flexible cells are also quite durable. The cells bend and can be placed along curved surfaces, unlike traditional cells which are more rigid and bulky. The lightweight and rugged aspect is very attractive to urban planning specialists because it allows endless possibilities on where and how the solar cells are applied on surfaces. Heeger explains that it has been demonstrated that semi-transparent solar cells can be created in a variety of different colors. Rather than the typical grey silicone that many do not find aesthetically pleasing, one can envision covering the façade of a building with solar cells in very interesting, architectural ways.

He explains, “One can utilize [these solar cells] on windows on big buildings all over the world. You can just imagine the area in New York, Chicago, or Hong Kong: there are huge buildings with big windows. That area is just wasted. Now, in fact, it’s worse than that—the sun comes beaming in and these building need better air conditioning. With these transparent solar cells, you could generate power. It’s like wearing sunglasses: you reduce the amount of heat radiating in the building.”

Solar cells need reasonably high efficiency to make the cells productive. Heeger explains that he and his colleagues originally sparked the idea in 1995 in the laboratory and created cells that were about 1% efficient.

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He explains, “Many people around the world see the potential value in this research. Now, the efficiencies [of our solar cells] are steadily rising up to about 10% and we foresee 15% in the reasonable future. By utilizing tandems cells, we could probably get up to 20% efficiency, which is fantastic.”

Heeger has collaborated with many people in various departments to conduct his research on solar energy. He explains that the strong boundaries between physics, chemistry, and material sciences has past, and that working across these boundaries is quite exciting. UCSB Sustainability looks forward to Heeger’s research as he continues to work on the efficiency of his solar cells. Although the solar cells have not yet reached the desired efficiency, his hard work and optimism around the possibilities scientific research has to offer is a giant stepping stone for what comes next in the world of solar cell research.

“We will get there,” Heeger assured me, “[Science] is exciting, and there’s nothing more exciting than discovery.” □



Santa Rosa Residence Hall is now LEED Gold!

By: Jordan Sager

UC Santa Barbara is excited to announce that its Santa Rosa Residence Hall has been awarded LEED Gold certification by the US Green Building Council! This certification follows a significant effort to upgrade and renew the building this past summer (2012). While the impetus for the project was the need for new fire sprinkler and alarm systems, UCSB Housing & Residential Services, in partnership with Design & Construction Services, took the opportunity to perform a sizeable list of additional improvements. Many of the upgrades contribute to minimizing water and energy use in Santa Rosa, while providing a healthier indoor environment for residents and staff in the building.

The upgrades to the Santa Rosa Residence Hall which collectively earned the building the distinction of LEED Gold certification are:

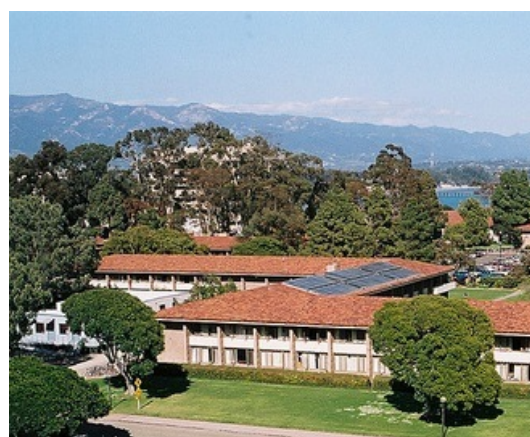
- Installation of high-efficiency and low-NOx boilers for water and space heating;
- Replacement of single-paned clear windows with dual-paned, reflective windows to reduce heat transfer and solar heat gain;
- Retrofit of ventilation and air condition equipment serving the recreation room, formal lounge, and offices;
- Installation of real-time energy metering with feedback for building occupants;
- Installation of new ultra-low flow water fixtures in all restrooms;
- LED lighting throughout common areas and restrooms which reduces the energy use of the building; and
- Installation of recycled carpeting in all common areas.



Santa Rosa was originally built in 1954 and is the oldest LEED certified building at UCSB. The Anacapa and Santa Cruz residence halls will undergo similar renovations during the summer of 2013 and 2014, respectively. Both are striving for LEED Gold certification.

If you have any questions about this project or about the green building program at UCSB, please contact jordan.sager@pf.ucsb.edu. □

Jordan Sager is the LEED Program Manager for Physical Facilities at UCSB.



EAB's Green Chef Competition

By: Jin Dunn

The Environmental Affairs Board (EAB) at UCSB has created and sponsored a wide range of eco-friendly events and activities over the years including the annual Isla Vista (IV) Earth Day, last year's IV Food Co-Op *We Own It* campaign, and this year's UCSB Clean Energy Teach-In. One of the more unique events that EAB throws every quarter is the UCSB Green Chef sustainable food competition. In the style of the hit Food Network series, "Iron Chef," this contest is a one of a kind competition that incorporates organic food ingredients and challenges students to create their own unique and healthy food dishes.

Since the competition's birth in 2010, Green Chef has given students an opportunity to experiment with food and become their own inventive and creative chefs.

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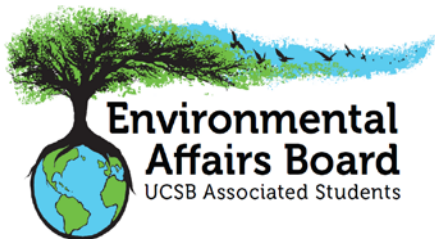
Contact: Kate Kokosinski

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Each quarter a secret ingredient from the Isla Vista Food Co-Op is revealed to the competitors a week before the contest actually takes place. This gives each participant in the contest enough time to experiment, plan, and create a dish. Each competitor is then judged at the end of the competition in three different categories: taste, creativity, and the use of sustainable ingredients. The winners of Green Chef are awarded with prizes from the Isla Vista Food Co-Op.

This event is currently coordinated and overseen by EAB's Sustainable Foods Chair, second-year Akoua Doffou, who lays out the rules for Green Chef. "There is no limit to how many chefs can compete in Green Chef, and only vegetarian dishes are allowed," says Doffou. She also mentions that in previous years there have been as many as 20 to 50 chefs who have competed. The competition has become a successful and popular event on campus and has helped to educate students on healthy eating alternatives, local and organic foods, and the environmental benefits of eating vegan and vegetarian.

Green Chef regularly takes place towards the end of each academic quarter. The next Green Chef competition will take place on **Sunday, June 2nd from 3:00 to 5:00pm at the Student Resource Building**. This quarter's secret ingredient has yet to be revealed! □



Gaucha Farmer's Market at UCSB

By: Roane Akchurin

Wouldn't it be a great idea to have a Farmer's Market right here on campus selling fresh, local produce and artisan products? We asked the same question and found out that it had been attempted several times throughout the past without much success. Well, it's finally here, and plans are being made for the first Gaucha Farmer's Market to begin this fall!

The idea and planning came about when 13 staff members who were part of the inaugural Gaucha University pilot program put the idea into action.

Gaucha University, or Gaucha U, is made up of six courses over six months and must culminate with plans for a project that would benefit the campus community. The Farmer's Market Group, also known as Cohort A, went through several ideas before landing on the Farmer's Market. The steps necessary to bring an idea like this to fruition was daunting at first, but step by step, Cohort A moved the project along. The idea was presented to campus stakeholders and was approved.

Although the Gaucha U program ended, some members of the Cohort decided to stay with the project. They also applied for a grant from The Green Initiative Fund (TGIF) and were awarded \$8,000 to fund initial start-up costs, student interns, and marketing efforts to get the project off the ground. Currently, Cohort A is in the process of creating two student intern positions as well as a structure for others to get involved.

A survey of students, faculty, and staff helped indicate the enthusiasm for the Farmer's Market as well as the best time during the day for people to attend. Over 5,000 people responded to the survey, and a majority preferred to have the Farmer's Market from **12:00 to 3:00 pm on Wednesdays**. After much consideration, the location was determined to be Parking Lot 23 between the Student Resource building and San Rafael residence hall.

As was shown through the survey responses, students, staff and faculty here at UCSB are very interested in sustainability and many put that commitment into action every day. In terms of fresh local produce, it became obvious that if a Farmer's Market were available on campus, many would want to utilize it.

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Upcoming Events

Sunday, June 2nd – EAB Green Chef Competition

The next Green Chef competition will be held in the Student Resource Building. If you are interested in participating, please contact Akoua Doffou, Sustainable Food Chair, at doffou@umail.ucsb.edu.

Fall 2013 – Farmer's Market Coming Soon!

The Farmer's Market is coming to UCSB in Fall 2013! The event will take place on Wednesdays from 12 to 3pm in Parking Lot 23 between the Student Resource Building and San Rafael Residence Hall.

Other campus entities and student organizations plan to partner with the Farmer’s Market to bring education and information about sustainability to the community at the same time.

Remember to check out the Gaucho Farmer’s Market at UCSB in the fall. Please visit Facebook to stay up to date on its progress

<https://www.facebook.com/gauchofarmersmarket?ref=ts&fref=ts>, or email gauchofarmersmarket@gmail.com if you have any questions or would like to get involved. □



Think Before You Pump...Paper Towels

By: Lauren Menzer and Maggie Jenkins

Have you ever seen the stickers on paper towel dispensers around campus saying “Please conserve, these come from trees” forcing you to think before pumping the lever four times? Well, the Zero Waste Committee has taken that one step further with their Towels2Trees paper towel compost pilot project.

Towels2Trees collects paper towels from bathrooms and composts them through our existing waste hauler. So far, the pilot project has been implemented in one building on campus and the project has received rave reviews. Data collected from the building shows that there is little to no contamination in the compost bins, and the landfill bin is seldom used. With these results, it is hopeful that the project can be implemented throughout additional UCSB buildings until the installation of Dyson Air Blades, hand dryers that work effectively and efficiently, can be funded in all restrooms.

Initial steps have been taken to integrate these energy efficient hand dryers into campus bathrooms. This quarter, freshman Lauren Dykman’s proposal to The Green Initiative Fund (TGIF) to install these high-tech dryers in the first two floors of the Davidson Library was approved. Stay tuned for the hand dryers to come to a bathroom near you!

In the meantime, the Zero Waste Committee will continue its efforts to compost paper towels and divert them from the landfill, continuing on the road to achieve the UC-wide zero waste goal by 2020. Towels2Trees will increase awareness with wide-exposure in multiple areas, educate the campus community, and communicate our waste targets. □

