SCI-Arc/Caltech competes at Solar Decathlon

JESSICA STOLLER-CONRAD
Caltech Writer

DALE is nearly ready to face the judges. The Dynamic Augmented Living Environment, Caltech’s collaboration with the Southern California Institute of Architecture (SCI-Arc) is now on-site at the Department of Energy’s 2013 Solar Decathlon competition site in Irvine, California.

The SCI-Arc/Caltech team has been planning DALE, its unique and completely solar-powered home, since its competition proposal was accepted in January 2012, along with proposals from 19 other American and international teams. Nearly 40 Caltech students participated in the design process, most of which took place in an engineering project course called Introduction to Multidisciplinary Systems Engineering, and offered during the 2012-2013 academic year. Of the students in this course, taught by Melany Hunt, Dotty Dick Hayman Professor of Mechanical Engineering and a vice provost, seven stayed on, spending their summer actually building the sustainable house.

Once the majority of construction was complete in late September, the SCI-Arc/Caltech team had to pack up DALE and physically move the entire house from its construction site on the SCI-Arc campus in downtown Los Angeles more than 40 miles south to Orange County Great Park in Irvine, where this year’s competition will be held starting on October 3.

While some of DALE’s competitors had to employ the use of large cranes to transport their entries or coordinate weeks-long international transportation to the competition site, project manager Andrew Gong (BS ’12) says that DALE only spent about three-and-a-half hours in transit.

“We picked up DALE with a heavy-duty forklift and placed it on long trucks,” Gong says. “And there wasn’t any damage other than expected small scrapes to the bottom of the forks.”

DALE’s design consists of two configurable, box-like modules—one kitchen and bathroom module, and one living and sleeping space module—that can move together or apart. When in the open configuration, DALE’s design exploits the ambient outdoor temperature to heat or cool the house, helping to maintain a comfortable temperature within the house without using extra energy for heating and air-conditioning. This moving house was designed with sustainability in mind, but the modules also made it easier for team DALE to truck its house down the interstate to Irvine. “Since the house is composed of modules, it was actually fairly simple to pack up and ship. The main issue was just making sure everything got packed on time,” Gong says.

The SCI-Arc/Caltech collaboration is one of 20 teams in the Department of Energy competition, each challenged to design and build affordable, attractive, energy-efficient houses that have the comforts of modern living but are powered only by the sun. As the name “Solar Decathlon” implies, teams will compete for the best total number of points in 10 contests. A panel of experts will use the contests to judge and score the entries based on features ranging from architecture and market appeal to affordability and each house’s ability to host a movie night—called the Home Entertainment Contest. The SCI-Arc/Caltech team wants DALE to score well in the overall competition, but the Caltech team members hope they score especially well in one particular aspect: the Engineering Contest. In this contest, a jury made up of professional engineers will judge each house based on the home’s functionality, efficiency, innovation, reliability, and project documentation. 

News briefs from around the globe

Helping readers burst out of the Caltech bubble

Need to know
< 100 words about the world this week – topics sorted from good to bad by The Tech Eds

US raids seize terrorists
2 al Qaeda operatives captured for bombings and Kenyan mall attack

Syria removes chemicals
1000 tons of sarin and sulfur mustard have begun to be removed

Strike ends in pay raise
10 percent pay raise given to South African car factory workers

Bungee jump record set
150 bungee jumps completed by Australian within 24-hour period

Deadly protest in Egypt
44 civilians killed during Muslim Brotherhood protest in Cairo

Federal deficit update
17 trillion dollars in total federal debt, from 1.4 trillion in 2009

Thousands left jobless
800,000 people on unpaid leave since government shutdown
Food with Mannion!

Do you like eating food? How about free food at nice restaurants? Ever want to tell the world exactly what you think of said food? The Tech will be beginning a new column to chronicle the foodie experiences of new writers every other week...The Catch: They’ll be going head-to-head with Tom Mannion who will be reviewing the same restaurant. If you have ever thought you were more of a gourmand than our resident master chef, now’s your chance to prove it!

Email us for a spot on the list at tech@caltech.edu

write articles for the tech

get paid up to $30

nominate your favorite professor for the Feynman teaching prize!

Here’s your chance to nominate your favorite professor for the 2013-14 Richard P. Feynman Prize for Excellence in Teaching! You have from now until January 2, 2014 to submit your nomination package to the Provost’s Office to honor a professor who demonstrates, in the broadest sense, unusual ability, creativity, and innovation in undergraduate and graduate classroom or laboratory teaching.

The Feynman Prize is made possible through the generosity of Ione and Robert E. Paradise, with additional contributions from an anonymous local couple. Nominations for the Feynman Teaching Prize are welcome from faculty, students, postdoctoral scholars, staff, and alumni.

All professorial faculty of the Institute are eligible. The prize consists of a cash award of $3,500, matched by an equivalent raise in the annual salary of the awardee. A letter of nomination and detailed supporting material, including, but not limited to, a curriculum vitae, course syllabus or description, and supporting recommendation letters should be emailed to kkerbs@caltech.edu or directed to the Feynman Prize Selection Committee, Office of the Provost, Mail Code 206-31, at the California Institute of Technology, Pasadena, California, 91125. Nomination packages are due by January 2, 2014.

Additional information including guidelines for the prize and FAQ may be found at http://provost.caltech.edu/Feynman-TeachingPrize. Further information can also be obtained from Karen Kerbs (626-395-6039; kkerbs@caltech.edu) in the Provost’s Office.

Caltech Public Events is now hiring student ushers.

$15 per hour to work concerts, performances, lectures, films and parties.

No experience needed, no hard labor, flexible schedules.

*Requirements: Caltech student, Positive attitude, Friendly personality

To apply email Adam Jacobo (ajacobo@caltech.edu) or call (626) 395-5907

For info on Caltech Public Events visit: www.caltech.edu/content/public-events
Caltech students unveil solar house design

PHOEBE ANN LAURA SANTOSO Contributing Writers

Hi everyone! This is the Caltech Y Column, designed to inform you about the Y and the opportunities we provide for you to inspire your passions, whether by participating in our programs or leading your own!

Founded by students in 1916, the Y was organized to provide extracurricular activities planned and implemented by students as an opportunity to gain leadership skills and discover their passions and themselves. The mission of today’s Y remains the same—to provide opportunities that will prepare students to become engaged, responsible citizens of the world. The Y seeks to broaden students’ worldviews, and raise social, ethical, and cultural awareness through teamwork, community engagement, activism, and leadership.

The Caltech Y’s mission and core values stand on five key pillars: leadership, civic engagement, service, adventure, and perspective. Regardless of which pillars capture your interest, feel free to attend any of the below programs, or contact us to organize your own!

Here’s a sampling of past programs held by the Y:
• Alternative Spring Breaks
• Make-A-Difference Day
• Hillsides Home for Children, LA County Arboretum and Botanic Garden, Children’s Hospital Los Angeles (Coachart), Eaton Canyon, Lifeline for Pets
• Explore LA: Lakers game, Next to Normal musical, Norton Simon Museum trip

Upcoming Events:
1. Mt. Pinos Day Hike Saturday | October 12th | 7:30 am - 6:00pm | Cost is $15
A trip is being organized for Sunday, September 15th to hike the summits of Mt. Pinos, Sawmill Mountain, and Grouse Mountain. The hike will be around 10 miles long with moderate elevation gain and the last section of the hike will involve a little off-trail hiking to reach the summit of Grouse Mountain. It can take up to two hours to drive each way to the trailhead.

2. Washington DC Science Policy Trip - Applications are available now, due Tuesday, October 15th by Noon
Monday, December 16th to Thursday, December 19th | Cost is only $350 (with round trip flight to DC and back to LA) or $325 (with one way flight to DC)
Dialogue with those who have played a role in setting and implementing science policy for the United States including: Academics, Lobbyists, Scientists, Politicians, and Caltech Alumni.

3. Rise Tutoring Program Mon.-Thurs. | 4-6pm | Winnett, 2nd Floor
The Caltech Y Rise Program is currently accepting new tutors.

4. Hathaway Sycamores Saturday | October 12th | 1:30-4:30pm | Highland Park
Volunteers at Hathaway-Sycamores, a group that supports local underprivileged but motivated high school students. Some of the subjects being tutored are AP Chemistry, AP Physics, and AP Calculus.

For more information and to RSVP email Josie Kishi atjishi@caltech.edu.

If you have any questions at all, feel free to contact the Caltech Y at (626) 395-6163 or caltechy@caltech.edu. Fee free to drop by at one of our weekly meetings at the Caltech Y at the Caltech Y (505 S. Wilson, next to CEFCU), time TBD.

Go to http://caltechy.org/lists/ to self-subscribe to announcement lists for upcoming events and sign-up information.

For a student’s perspective, feel free to contact Phoebe Ann at phoebe.ana2@gmail.com or Laura Santosso at santosso.laura@gmail.com.
Brad/Chad Couture: Trying out color combos

Rotation is finally over! I hope everyone got into a house that they were hoping to be in and I wish all the frosh well at their respective new homes. A special shout out to my new Pageboys.

Now that that headache is over with, there should be a bit more free time in everyone’s schedules to try something new. I will be discussing a couple fashion trends that can be successfully incorporated into anyone’s wardrobe.

The first is mono-color layering. The idea here is picking one color – Massive Open Online Courses. As the name suggests, these online courses reach tremendous numbers of students, with large MOOCs enrolling more than 100,000 students and average courses reaching 50,000 students.

MOOCs are very new to the field of education, and many follow a similar style. Typically, students enrolled in a MOOC watch video lectures that are significantly shorter than traditional college lectures, often less than fifteen minutes. These quizzes are checked by in-lecture quizzers, which are often very simple questions designed more to ensure the student was listening than to test for deep conceptual understanding. Additionally, readings and links may be posted to the website alongside the lectures. Students then take online quizzes or homework assignments, and at the end of the course usually receive a certificate denoting their completion of the MOOC.

The second is color-blocking. (I hope that you’re reading this Jackie Maslyn)

This is a fairly popular trend and one of my personal favorites. Color-blocking involves the use of opposite or near opposite colors on the color wheel. An example of such a pair of colors would be red and green or red and blue. This look is very popular during the summer when brightly-colored shorts are in season but can also be used during the fall/winter with deep or strong shades of color.

It’s a very simple concept: wear contrasting colors in solid “blocks”. As you may have already guessed, in this particular style, patterns are generally avoided in favor of solids. Feel free to experiment with bright colors in your pants, tops, outerwear, and for the ladies, your shoes.

I hope that this encourages some of you to take a step out of your comfort zone and try one of these two easy to pull off looks.

A Request:

I see more than enough of myself everyday so I don’t want to also see myself in the paper. If this becomes regular I see more than enough of myself in the paper every week. I myself in the paper every week. I would like to ask that those of you who like to dress on the more stylish side do so.

Hopefully I will run into you on campus and have you featured in the paper. If this becomes regular then perhaps there can be a prize (DRU) at the end of the term for best dressed.

Brad Chattergoon relaxes in the Ricketts Lounge while demonstrating mono-color layering.
Tech alumna’s film Josh inspires audiences

MALVika VERMA
Staff Writer

Not all of us are going to impact the world with our scientific prowess. According to Wikipedia, Frank Capra waited tables, worked at the campus laundry facilities, and played the banjo at nightclubs when he was in a Tech. Within 25 years after graduating, he received 3 Best Director Oscars.

Similarly in the world of cinema, because of one woman over the age of 25 (Urdu), alumnus Iram Parveen Bilal is making her mark. This past summer, I had the opportunity to catch her first feature film at the London Indian Film Festival. Titled “Josh (Against the Grain),” it is not only the first Pakistani film to be shown at the festival, but it is also the first selection with a female director.

Inspired by a woman Parveen Syed who runs food kitchens around Karachi, the film has a powerful message: one person can make a huge difference in the world. Fattima (Aamina Sheikh) is a privileged teacher in her 20s living a comfortable life in Karachi. Her mother died when she was a child, so she was raised by her cousin Nusrat-bi (Nyla Jafri) while her busy lawyer father provided her with a sheltered upper-class lifestyle. One day, Nusrat-bi does not return from a holiday visit to her home village. Against the wishes of her family and friends, Fattima goes to investigate the truth behind her return to Karachi.

What really stood out about the film was the extraordinary cinematography by Naushreen Dadabhoy. We are introduced to the hustle and bustle of Karachi by following a basket being lowered from a home to a vegetable seller. Dadabhoy captures the dichotomy of developing cities as they sweeping across crowded city streets contrast with the vastness empty expanses of the poorer villages on the outskirts of the city.

The audience gets a sense of what it is like to live in Karachi, and this helps keep them captivated. During the Q&A following the screening, several natives from Karachi complemented Iram on depicting their city so beautifully. There are, though, a few things I think could have been better. Side stories were half-baked, a suggested love triangle was unnecessary since it was left undeveloped, and transitions between scenes were abrupt. The shots of the moon and grain were beautiful, but it sometimes felt like they were just throwaways in order to drive the film forward.

Overall, these are minor issues, and the festival audience and I were indeed engaged throughout the film. Josh is thought-provoking and is already inspiring people to make a difference. In Iram’s words: “Change can be thought. Change can be action. Change can be people. Change can be two people.”

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The Tesla Model S: What all the fuss is about

CASEY HANDMER
Contributing Writer

Push the accelerator. Feel the power tilt you over and suck your eyes into your head. In complete silence. Electric cars are the future, and in Tesla’s revolutionary Model S, the future is here.

For those who live under a rock, Tesla has successfully brought their only five years to market. The room erupts in laughter. The general consensus in the old NUMMI plant. Tesla finally declare bankruptcy to the particularly hard-core Hollywood advocate types, in that owning one of these cars out with a variety of gag-inducing styling decisions. No doubt this appeals to the particularly hard-core Hollywood advocate types, in that owning one of these cars does feature some reasonably innovative ideas, its styling is an echo of the pre-Tesla era. All car manufacturers that operate in the United States have to deal with interlocking state-by-state compliance issues of Byzantine complexity.

One of the most effective California’s requirement that a certain number of electric cars be produced, presumably to spur technology development by reluctant and largely calcified manufacturers that operate in the world, and by the end of 2014, these cars would have been on the market. In California, there is no provision that would trigger the final death spiral. If I had to guess at what possible options are available, I would say a similar plan was considered for Maryland. It was also recently proposed in Texas. If and when it goes into place, it will likely have a similar impact to ‘the next Apple’

As the cars became more available (nearly 20,000 have been built to date), competitors’ engineers would have to get their hands on one and finally see what they were up against. At BMW, it was too late. You can no longer buy a BMW i3. The BMW i3 is a step forward in electric car technology, but it is not the electric car of the future. The BMW i3 is a transitional model, not a futuristic car. The BMW i3 is a transitional model, not a futuristic car. BMW is still experimenting with electric cars, and it is likely that they will continue to do so until they can be sure they have a successful model.

Does this mean that Tesla is doomed? Not at all. Tesla is still a leader in the electric car market, and they continue to innovate and improve their products. They are also working on developing autonomous driving technology, which could revolutionize the industry. In conclusion, Tesla is still a leader in the electric car market, and they continue to innovate and improve their products. They are also working on developing autonomous driving technology, which could revolutionize the industry.

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Daimler and Toyota both bought stakes in Tesla during its years of perdition, and both have now produced unoffensive though unspectacular cars using the Tesla drive train. From here, Tesla’s aggressive rollout of supercharger technology could well mean the creation of an ecosystem which will become the de facto national market to dominate. Friendly competition, is also possible and, broadly, a desirable outcome. A third market rate and an inevitable slide into obsolete irrelevance. A third...

Today’s Puzzle: Crossword

Across
1. Evanesce
5. Item of information
10. Military vehicle
14. Mountain goat
15. Asinine
17. Incline
19. Flower
20. Kind of weasel
22. Fleece
23. Memorization by repetition
24. Court game
26. Apprise
28. Velocity
31. Misery
32. Fiesta
35. Affirm
37. Fragrance
41. In the past
42. Cabin attendant
44. Delved
45. Bird shelter
47. Reconstruct
49. Boundary
51. Acquire knowledge
52. Paper fastner
56. Spice
58. Narrow secluded valley (Scottish)
59. Earlier time
64. Public transport
65. Noblemen
66. Characteristic of birds
68. Reverse an action
69. Part of a church
70. Stringed instrument
71. Stalk
72. Cervid

Down
1. Number one
2. Lessen in intensity
3. Friend
4. Wide scope
5. Brief immersion
6. Arefsh
7. Tropical starchy root
8. Combination
9. Unhurried and relaxed
10. Hunting dog
11. Remote in manner
12. Offensive
13. Hinge joint
20. Minute charge.
21. Gravitation
22. Fleece
23. At one time
24. Court game
25. Furniture item
27. Amphibian
29. At any time
30. Holds two adjacent pieces together
31. Self
34. Also
36. Walk through water
38. Peculiar
39. Drinking container
40. Mature
42. Pace
43. Horse description
46. Defamation
48. Put into the care of someone
50. Domesticated llama
52. Groove or narrow
53. Gradient
54. Laconic
55. Roof overhang
57. Large tropical ray
58. Type of duck
59. Legendary creature
60. Cheerful and bright
61. Smooth fabric
62. Narrative
63. At present

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Disclosure: I am long TSLA.

What you need to know about the Model S

This far I’ve heaped praise and scorn in equal measures, so let’s get to the nitty gritty. In the above table, the safety rating is poorly resolved. It’s worth noting that your actual outcome will depend on rare-earth materials, depend on rare-earth materials, technology that does not provide the benefits of enormous mass production, scalability, and statistical reliability. Coupled with intelligent battery management software, a much more versatile pack results. When performance degrades, problematic cells can be substituted robotically, giving a cheap upgrade. The Tesla battery pack also forms part of the car’s chassis, increasing stiffness and also providing for battery swapping capability. Each cell provides 3101mAh of electricity at 3.7V, and together the battery can provide 1200A at around 340V, delivering 310kW to the power train. In charging it can accept 120kW (at around 250A) for a ~40 minute charge.

When optimizing electric motors, the usual approach is to use high voltages and thin wires, combined with powerful magnets. Tesla uses a liquid-cooled AC induction motor. It doesn’t have permanent magnets, and thus its power depends on high current. The Tesla motor is optimized for low voltage, high current, and high torque, something the battery pack can readily provide.

Of the many innovations developed in the Model S, the last I’ll present is the user interface software. Tesla uses a large touch screen to operate everything except the hazard lights and the glove compartment. Software updates can be downloaded via mobile networks. The car can be upgraded, fixing issues, adding functionality, and altering the mood with time. The modular, software-based approach will redefine the usual lifecycle of a car as a consumer product.

With any luck, we’ll see these obvious (in hindsight) ideas applied in future cars across the industry. But what does the future hold for Tesla?

Going forward, Tesla plans to ramp production of the Model S to meet demand in Europe, North America, and Asia. Starting late 2014, Tesla will begin production and delivery of the Model X crossover. Based on the Model S chassis, though somewhat longer and taller, the Model X will seat 7 adults and their luggage, and leverages continuing advances in battery technology for a similar range. The Model X will have an AWD option, which will also flow to the Model S, and may see it in 0-60 time reduced even further.

Further ahead, Tesla plans to bring a third generation vehicle(s) to market in about 2017. Based around a smaller common chassis and starting at $35,000, these cars will be produced at a rate of half a million per year, aiming for about 5% of global market share.

Disclosure: I am long TSLA.
Caltech runners set personal bests

GoCaltech

In their final tune-up before SCIAC competition, the Caltech cross country teams lined-up at the Pomona-Pitzer Invitational on Saturday morning.

In the men’s race Aditya Bagvathi set a personal best 8K mark. His time of 26:45 was a 27 second improvement from his previous best collegiate time at the distance. The sophomore has been Caltech’s best finisher in all three races this season.

Alex Pien was close behind as he finished second among Beaver harriers with a time of 26:52.

Ian Koss, competing on this course for the third time, set a personal best mark at the event by crossing the finish line in 27:51.

Jared Forte continued his solid comeback from an injury by scoring points for the time since his first-year with the squad. The junior was the fourth Caltech finisher with a time of 27:55.

Rounding out the scoring runners for Caltech was Michael Ignatowich (27:57).

During the women’s race Stephanie Reynolds continued her steady running by placing first among Beaver runners with a time of 24:14.

Senior Marlyn Moore, one day after her birthday, had a personal best course of 25:03 in her final run at the Invitational.

Juliette Becker’s time of 26:41 was good enough for third best among the Beaver runners.

First-year Emily Mazo continued her solid campaign by running the 6K course in 27:36 while Rachel Thorp rounded out the scoring runners with a time of 27:44.

The Beavers’ next meet will be the SCIAC multi-dual on Oct. 18th at La Mirada Park.

Soccer team plays solid defense

GoCaltech

The Caltech defense came up strong time-and-time again but the Redlands men’s soccer team did just enough to grab a 1-0 win on Wednesday evening.

“Today was our most complete game. We played a full 90 minutes. Even though they had a lot of shots we played defense well. We put J.D. in a good position to make the saves he had to make,” head coach Rolo Uribe said.

“We took another step forward today and we are becoming a more mature team,” he added.

The game’s lone goal came in the 12th minute when Evan Keny-Guyer scored on a rebound inside the box from five yards out.

While the Bulldogs put 10 shots on goal during the game, the combination of solid back line defense and goal play allowed the Beavers to stay in the contest.

Caltech’s best chance in the first period came in the 25th minute when Pedro Ojeda made a run down the right side but his shot from about 15-yards out was blocked aside by Andreas Silva. Late in the half Jared Reed had a shot blocked aside by a Redlands defender inside the box.

The home standing Beavers played rock-solid defense in the final 45 minutes as they kept the visitors off the scoreboard.

Ojeda had another opportunity to score but his attempt in the 61st minute was saved again by Redlands’ Silva.

The Beavers next shot to get in the win column comes on Saturday afternoon at 4 p.m. when they host defending SCIAC champion Claremont-Mudd-Scripps.

Weekly Scoreboard

Women’s Volleyball vs. Whittier L, 3-0 Final

Men’s Water Polo at La Verne L, 11-19 Final

Women’s Volleyball at Cal Lutheran L, 3-0 Final

Men’s Water Polo vs. Washington & Jefferson L, 18-12 Final

Men’s Soccer vs. Claremont-Mudd-Scripps L, 6-0 Final

Men’s Water Polo vs. La Verne L, 19-11

Men’s Water Polo vs. Notre Dame L, 15-5

Men’s Water Polo vs. Penn St. Behrend W, 9-8
Acquired Taste

Dr. Z

I asked this kid what kind of vegetable he would be, and he said cucumber.

Definitely blacker. NEXT!

The Tech would like to apologize to all who felt offended by a comic that was printed last week. Our lack of thought on the issue was unacceptable, and we aim to ensure that such content will not be found in the Tech in the future.

For more photos, videos, and archives of previous issues, check out the Tech website!

tech.caltech.edu