INTERVIEW: SARAH MILLER

While still an undergraduate, Sarah Miller served as the Architecture and Design Manager for Purdue’s INHome project, which constructed a self-sufficient solar home for the Department of Energy’s Solar Decathlon. Despite this being Purdue’s first time participating in the international contest, the entry earned second place.

What is the U.S Department of Energy Solar Decathlon/INhome project?

The Solar Decathlon is a U.S. Department of Energy-sponsored event that has occurred every 2 years since 2002. It is an intercollegiate, international competition where each team is commissioned to design and build a 1,000-square-foot solar-powered home for under $250,000. Team Purdue’s entry into the 2011 decathlon, Purdue’s first time in the competition, was called the “INhome” for Indiana Home. With a second place overall finish at the decathlon, we felt we had not only represented Purdue well on a national stage, but also reached the public with the Midwestern perspective. Purdue did particularly well in the affordability part of the contest, with a total costs for materials, installation, and labor of $257,000. All the construction documents are available online for anyone to use at solardecathlon.gov, and the house itself is now sitting on Shenandoah Drive in Lafayette near Target. We’re working with a developer on its permanent foundation and getting everything finalized. We hope to have someone living in it this year.

And this was a student project?

Yes, over 200 students, both undergraduate and graduate, at Purdue touched the project. There was a core group of people, probably around 20, that lived and breathed this project for two years. There were four of us (including myself) who wrote the proposal in the fall of 2009 to the Department of Energy, prior to our selection as one of the 20 competing universities. We gathered all the information we could to start this project and began conceptual designs. After our acceptance into the decathlon, students came on board, wanting to be part of such an exciting thing. I, as Architecture and Design Manager, our Logistics Manager Derek Kultgen, and our Engineering Manager Jordan Wallpe were so involved in the ins and outs of the project that it made it difficult to leave in the middle, so we decided to stay at Purdue for graduate school.

How did you get involved in the Solar Decathlon?

It’s kind of funny. One of my professors in the interior design department mentioned the Decathlon, because they were looking for interior design students to join the team. I was actually the only one from interior design who jumped on board right away; I still remember going over to Knoy Hall for the first time, and meeting up with mechanical engineering technology guys. It was initially intimidating to work with the different levels and colleges, but if I were to go back, I would do it a hundred times over again. The experience working in this interdisciplinary environment taught me so much about teamwork that I will carry into the professional world. At the beginning, we all felt like our opinions were coming from different worlds, but by the end, we spoke each other’s languages. I think the biggest challenge was time,
though. We didn’t sleep—it was bad! On top of all the other classes we were taking, we were completely devoted to designing and building this home.

**What was your role as interior designer?**

The concept for the INhome was the “All-American Home.” We wanted this house to appeal to the mass market of North American consumers, and escape the perception that a solar-powered home had to be really modern and look really techy, like something out of Star Trek. We wanted to make a house that looked and felt like home, but behind the scenes was an efficient machine. That philosophy helped determine a lot of our decisions on interior finishes and technology. Everything in the INhome is local to the Midwest or right off the shelf. Our hickory hardwood floors came from Nashville, and our cabinets were made in Grable, Indiana. We also wanted something that was very sustainable to our community in Indiana. We used recycled materials whenever we could. Our countertops were made of 40% post-consumer recycled content. Although they look like granite, its actually acrylic, which is essentially the same material cutting boards are made out of, so it’s really durable. When a manufacturing plant produces goods with acrylic, they sell their scraps to the countertop manufacturer, who in turn produces something beautiful and useable for homeowners. Also, if you turned on all of the interior and exterior lights in the INhome at once, you would be using less than 600 watts. We really tried to balance cost with sustainability.

**What do you think is the most unique technological contribution the house has made?**

Well, the coolest feature in the INhome is probably the Bio Wall. Kevin Rodgers, our Project Manager, now has a patent pending. It is such an innovative feature because it is not only a living plant wall, but it pulls the return air, or dirty air, in the home through the Bio Wall itself. As the air is passing through, heartleaf philodendron consumes carbon dioxide and other contaminants in the air, naturally cleaning it for us. The Bio Wall is connected to the INhome’s HVAC system, allowing the passively cleaned air to return to the space as supply air. This process eliminates the need for an air filter. It also reduces the need to pull clean air from outside the home, which then would need to be conditioned. The Bio Wall does the work for the HVAC system.

**How do you think being involved in the Solar Decathlon changed or affected the experience of being an undergraduate at Purdue?**

This project completely changed my life. I started out and finished at Purdue as an interior design undergraduate student. I knew that interior designers have the opportunity to pick sustainable finishes and make environmentally conscious decisions, but I was not sure how much of a voice designers had on a building as a whole. Jumping in on this project really showed me this was possible. Being a representative of the College of Liberal Arts and working collaboratively with engineers and technologists to actually build a sustainable, net-zero energy building taught me so much that I wouldn’t have learned from coursework alone. When we started building the house last summer, we all felt an indescribable feeling of pride. The ability to walk inside something tangible that came to life off of a piece of paper, was (and is) incredible. All of this really led me to the desire to go on to graduate school, and that is why I am now just starting out as a graduate student in Building Construction Management at Purdue University.

**What advice would you offer other undergraduates thinking about getting involved in research and experiential design projects like INhome?**

Purdue gives students great opportunities to be part of things that make global impacts. So many students just come into Purdue to do their required courses and graduate. They take home their piece of paper and leave. That is fine, but there’s so much more to experience if you grab the opportunity. I’m so glad I was on the Decathlon team. I encourage anyone, undergraduate or graduate, from any college to get involved in a project that allows you to do something that’s bigger than yourself. Yes, it looks good on a résumé, but what you’ll learn and the pride you’ll share with your teammates carries you much further than that. College is our only opportunity to make mistakes without risking major consequences. In the real world, if you mess up, your career is on the line. People have to see an opportunity and take it, but are just too scared sometimes. You just have to jump!


**Interviewer**

Richelle Wescott is a senior in professional writing with a minor in management, and served as JPUR’s journal coordinator for this volume. Wescott aims to continue to graduate school in journalism, and will pursue a career in either magazine journalism or public relations.