



Gerhold with advisor Dr. Don Spickler



Code for Good Challenge



Eastern Shore Regional GIS Cooperative

## Henson School of Science and Technology

### Physics Students Design Solar E-Bike

Physics majors Sam Brown, Katie Murphy and May Palace received \$1,000 in National Science Foundation (NSF) funding to construct a solar-powered e-bike. The project is part of Salisbury University's NSF-funded Bridges for SUCCESS (SU Connections to Careers for Every STEM [science, technology, engineering and mathematics] Student) program. Dr. Joe Howard, SU professor of physics, serves as the group's faculty mentor.

Though motorized bicycles date back to the 19th century, the SU team is putting a decidedly 21st-century twist on its bike, adding solar panels as the energy source. According to Palace, the project fits well with SU's "green" philosophies: "Salisbury is a school that is really interested in clean energy and sustainability. We thought a solar bike would complement those interests, as well as our own."

"We want to reduce the carbon footprint while maintaining the convenience of travel people are used to," said Murphy, noting that a solar-powered e-bike would combine the environmental friendliness of a bicycle with the flexibility of regular automobile travel.

Brown added that the ease of use would trump even that of an electric car since users would not need to rely on charging stations or electrical outlets to power the vehicle. And if all else failed ... they could pedal.

The group completed construction of the bike in mid-July and are running tests and calculations to determine carbon footprint reduction and total energy savings – in terms of both power supply and human exertion.

The Physics Department plans to keep the bike as a demonstration tool. Brown, however, sees the potential for more: "Who knows? Maybe this could be the basis for a business."

### Women of Science Present Nationally

From presenting research on Capitol Hill to attending a "Scientista" symposium at the Massachusetts Institute of Technology, SU students are helping break the glass ceiling in STEM (science, technology, engineering and mathematics) fields. Recent graduate Erika Gerhold was, for the second consecutive year, the sole representative of a Maryland campus selected for "Posters on the Hill," attended by U.S. Congressional leaders and national funding agencies. She shared her studies of mathematical structures that help keep credit cards secure. Physics major May Palace was one of six SU students – with Sarah Confrancisco, Rachel Flanagan, Katherine Murphy, Louise Coltharp and Veronica Martinez-Vargas – at the Scientista Foundation's inaugural event and one of two selected to explore the emerging field of biomimicry during a PBS NOVA Making Stuff Wilder IdeaLab workshop in Boston. During the four-day workshop, they used nature to inspire inventions to solve complex human problems.

### Computer Science Majors Win Code for Good Challenge

After creating a website application that combines fitness and gaming, four SU computer science majors won first place in J.P.Morgan's fall 2013 Code for Good Challenge in New York City. They used their technical skills to help Mana, a nonprofit that provides ready-to-use fortified foods for malnourished children in developing countries. The team's website allows users to track calories burned through exercise and then personally donate or challenge friends, groups or corporate sponsors to make 30-cent contributions to the nonprofit for every 500 calories used. "I'm proud of what we created," said Cale Bowen, whose SU teammates included Brandon Altvater, Rob Close and Matt Thorne. They, along with two students from Columbia and the Rochester Institute of Technology, topped 23 other teams, including Harvard and Carnegie Mellon.

## ESRGC Celebrates 10 Years

SU's Eastern Shore Regional GIS Cooperative (ESRGC) has been on the map for 10 years. When it started in early 2004, the ESRGC's goal was to improve Geographic Information System (GIS) technology capabilities on the Mid- and Lower Eastern Shore, especially for county and municipal governments. Over the past decade, the ESRGC has worked on 135 projects, totaling more than \$5.6 million in grants and contracts. During that time, the ESRGC has mapped subjects ranging from threatened bird sanctuaries and Chesapeake Bay critical areas, to high-speed Internet availability, to trends in state unemployment and crime. The team also has explored historical maps and nautical charts; flooding vulnerability; public transportation systems; the infrastructure of municipal water, sewer and storm water systems; and more. In addition, staff have done countless pro-bono projects for individuals, non-profits, schools, governments and businesses. The ESRGC has employed and trained nearly 100 student interns and graduate assistants over the last decade.

## Ericksons Earn \$48K National Science Foundation Grant

Thanks to a National Science Foundation (NSF) grant, SU students and faculty have a new tool to measure light intensity in their research on worms, plants, fish and other subjects. Dr. Patti Erickson of SU's Biological Sciences Department, in partnership with Dr. Les Erickson, who also teaches in the department, received a \$48,915 major research instrumentation award from NSF to purchase a multi-mode plate reader.

The machine rapidly measures the intensity of light absorbed or emitted by samples. Erickson said its "potential uses are extensive due to its high capacity, speed, sensitivity and versatility." Personally, the tool will assist her studies of the effects of oxidative stress in nematode worms that have been genetically modified to express fluorescent proteins. Collaboratively, it also will be used by Dr. Joseph Pitula at University of Maryland Eastern Shore and others at SU.

Les Erickson sees benefits to his study of enzyme activity in flowering plants, while SU chemistry professor Alison Dewald can better explore enzymes whose structures, but not functions, are known. Dr. Eugene Williams of Biological Sciences will use it to continue exploring the impacts of rapid temperature fluctuations on the metabolic processes and cell membrane structure of arctic charr fish.

"In addition to enhancing the research productivity of faculty, the reader will allow us to better train our students who are becoming the next generation of scientists," Patti Erickson said. Undergraduate and graduate students will use it to collect and analyze data.

"It's a flexible, low maintenance, programmable instrument that will facilitate a wide range of analyses that are beyond our existing technology and capacities," she added. "We expect it to inspire future faculty and student research in the areas of cell and molecular biology, physiology, and biochemistry once its capabilities are realized."

Erickson (left)

