URITC researcher Dr. Michael Greenfield has been named the recipient of the 2011 Global Road Achievement Award in Research by the International Road Federation (IRF) for his project, “Simulating Asphalts on the Molecular Level.”

Greenfield was notified in late November that he had been selected. He will receive the award at the IRF Awards Ceremony in Washington, D.C. on Jan. 24 during the annual Transportation Research Board meeting.

“It is thrilling that the practical world of transportation and roadways is recognizing the value of fundamental research into the properties of materials that are relied on every day for proper road functioning,” said Greenfield. “I’m quite honored that the International Road Federation has chosen to recognize our contributions with this award. I look forward to my group contributing even more knowledge to the literature about asphalt material properties.”

Greenfield, who was named the 2009 URITC Researcher of the Year, is an Associate Professor of Chemical Engineering at URI. Prior to URI, he worked as a researcher for Ford Motor Company.

The professor’s experience of studying how complex systems function on the molecular level was tested when it came to asphalt.

“With asphalt, there isn’t even always agreement about what compounds are found inside,” explained Greenfield. “An asphalt taken from one crude oil source can have a very different chemical makeup than one from another source, even though they are both called asphalt. That brings a challenge to the modeling that is not present in other kinds of systems.”

In 2011, the Green Design Academy became the newest summer academy offered by the URITC. The academy enabled students to learn what sustainability means and how it influences the design of communities and landscapes.

Each day, students used different modes of transportation, such as walking, cycling, taking subways and trains, and riding in vans to access and experience the built and natural landscapes.

“By experiencing different modes of transportation and landscapes exhibiting ‘green’ improvements and choices that can be made to reduce our impacts, students were shown that they can choose how to live and that their choices do have an impact on the places they live and on the systems on which they rely for sustenance,” said Professor Will Green, who led the group and is the chairman of URI’s Department of Landscape Architecture.

Funding was provided by RIDOT through a FHWA grant.
Prof. Sheridan Honored with Merit Award

On Dec. 9, the Rhode Island Chapter of the American Society of Landscape Architects (RIASLA) presented URI Professor Richard Sheridan with its Merit Award for his contributions to the publication, *Rhode Island Department of Transportation Salt Tolerant Tree and Shrub Guide*.

Sheridan teaches in URI’s Landscape Architecture Department and has conducted research projects for the URITC.

Assisting Sheridan in the research for the publication was Professor Brian Maynard (Plant Science), Brian Harrison (URI Landscape Architecture class 2010) and Chris Mantheuffel (URI Landscape Architecture class 2010).

“Roadways are one of the major creators of water runoff and roadside ‘green oases’ become filtration systems, absorption systems and habitat refuges while helping to cut down on heat mass,” stated Sheridan. “The manual we developed provides RIDOT landscape personnel and engineers with easily accessible guidelines for planting salt-tolerant, functional, durable and attractive roadside landscapes and provides a potential palette of planting material for use on roadsides broader than that in current use. The publication was in line with Rhode Island’s aspirations for sustainable green infrastructure.”

Building a Better Battery

A team of researchers have recently been awarded a $6 million, three-year grant from the U.S. Department of Energy to figure out how to improve the efficiency and longevity of batteries.

The group includes URI engineering professor Arijit Bose, URI chemistry professors William Euler and Brett Lucht, and Brown University engineering Professor Pradeep Guduru. Lucht and Guduru previously partnered on a project in 2010.

Lucht and Euler will try to determine how modifying the liquids inside a battery can diminish the negative consequences of the reaction between the electrolytes inside batteries and the metals that form the terminals. Bose will research how using different container metals can control the buildup of film.

“There’s an opportunity for us to contribute in a unique way to a problem of significant importance,” said Bose. “There’s no question 100 years from now we’ll be seeing electric vehicles so the question is can it be 50 years or 20 years?”

The efforts of the research team and their students will hopefully result in longer-lasting cellphones and electric vehicles that can travel much further without a charge.
Prof. Craver Receives the Rudolph Hering Medal

Vinka Oyanedel Craver, an assistant professor in URI’s Department of Civil and Environmental Engineering, has received the Rudolph Hering Medal from the Environmental and Water Resources Institute of the American Society of Civil Engineers (ASCE).

The award was for her paper “Ceramic Filters Impregnated with Silver Nanoparticles for Point-of-Use Water Treatment in Rural Guatemala,” which appeared in the June 2011 issue of the ASCE Journal of Environmental Engineering. The paper was co-authored by Erin Kallman and James Smith from the University of Virginia.

According to ASCE, “the medal is awarded to the author, or authors, of the paper which contains the most valuable contribution to the increase of knowledge in, and to the advancement of, the environmental branch of the engineering profession.” Craver and her co-authors conducted laboratory and field testing of the effectiveness and social acceptability of the ceramic filters. Field studies took place in the Guatemalan highland community of San Mateo Ixtatán. Overall, the findings of this study suggested that locally manufactured ceramic filters can significantly improve the microbiological quality of water when used as a point-of-use water-treatment technology. Craver has worked on research projects for the URITC. She also leads the URITC’s Engineering Academy in the summer.

Finding a Safer Way to Clean Up Oil Spills

URITC researcher Arijit Bose and URI chemical engineering professor and Geoffrey Bothun have been awarded a three-year grant to study the effectiveness of environmentally friendly nanoparticles instead of chemical dispersants as a means of stabilizing oil droplets in seawater.

“The goal is to keep the oil within the water column, or under the surface, so that ocean bacteria can eat it. If the oil rises to the surface, the lighter components evaporate, leaving behind the heavy components that are difficult to disperse,” stated Bose in a URI press release. “These heavy portions make their way to shore, with subsequent damage to the ecosystem and food chain. It’s important to contain all of the components of the oil in the water column so the bacteria can do their job.” Bose will study how carbon-based nanoparticles, rather than chemical dispersants, can be used to stabilize the oil droplets in the water and ensure that the droplets do not coalesce and become too big for the bacteria to feed upon.

Bothun will collaborate on his research with Vinka Craver, URITC researcher and URI assistant professor of civil engineering.

“It’s like putting a little candy on the particles to attract the microbes,” explained Bothun. “This will enhance the growth of the microbes and their desire to eat the oil.” Funding for this research was provided by the Gulf of Mexico Research Initiative, which was set up by oil company BP.
EISENHOWER FELLOWSHIP PROGRAM

For the seventh consecutive summer, the Federal Highway Administration’s Eisenhower Fellowship Program allowed students from University of Rhode Island and the University of Puerto Rico at Mayagüez (UPRM) to research transportation-related subjects at the other’s campus.

The eight-week program also included students from Purdue University and Howard University. The students shared the results of their research on July 29 at the URI library. For the first time, everyone at URI and UPRM, along with guests in Washington, D.C., were able to view the presentations live via video conferencing.

<table>
<thead>
<tr>
<th>Project</th>
<th>Student</th>
<th>Faculty Advisor</th>
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<td>Establishing a Method for Extraction of Polycyclic Aromatic Hydrocarbons from Contaminated BMP Soils</td>
<td>Davis Chacon Hurtado (UPR Mayaguez)</td>
<td>Dr. Vinka Oyanedel-Craver (URI)</td>
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<tr>
<td>Message Signs Study to Improve Work Zones Bottleneck Issue</td>
<td>Josue D. Ortiz-Varela (UPR Mayaguez)</td>
<td>Dr. Jyh-Hone Wang (URI)</td>
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<tr>
<td>Geotechnical Research On Underground Pipelines and Wind Turbine Foundations</td>
<td>Stuart Crooks (Howard University)</td>
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<tr>
<td>Possible Impacts On High Preterm Birth Rates In Puerto Rico</td>
<td>Laura A. Schifman (URI)</td>
<td>Dr. Ingrid Y. Padilla (UPR Mayaguez)</td>
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<tr>
<td>Implementation of Safety Edge in Puerto Rico</td>
<td>Leilany K. Benejam (Purdue University)</td>
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<td>Design Wave Conditions for Puerto Rico and the U.S. Virgin Islands</td>
<td>Matthew Perkins (URI)</td>
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<tr>
<td>Geosynthetic Reinforced Soil Integrated Bridge Systems in Puerto Rico</td>
<td>Susan Refai (Purdue University)</td>
<td>Dr. Benjamin Colucci (UPR Mayaguez)</td>
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The URITC participated in the University’s Sustainability Program on Oct. 13 by making the driving simulator available to URI students. Parked in front of the Carlotti Building, home of the URITC, students learned how the simulator can be used to study fuel consumption, as well as driver safety.

URITC researchers Dr. Norbert Mundorf and Dr. Richard Sheridan also took part in the program by answering questions following a screening of “The End of Suburbia: Oil Depletion and the Collapse of The American Dream.”
URITC JOINS THE SOCIAL NETWORK

The URITC recently created Facebook pages for its summer workforce development programs, as a way of staying in touch with past participants.

The pages have not only served as a means for the Center to post photos, videos and related articles, but it has provided an opportunity for former students to reconnect with fellow participants, reminisce about their experiences and describe how the URITC’s programs influenced their educational and career paths.

Here are some of the comments received from past participants through Facebook.

“I had an absolutely amazing time with STI! I learned a lot and made some incredible memories. I will never forget my group. We had so much fun and I made a lot of new friends, several of which I still keep in contact with.”

Julia A. Davis
2008 STI

“Due to all the great experiences, I have taken a huge interest in flight and just started a partnership with Horizon Aviation! I should be in flight school by this summer.”

Paul Taylor
2010 STI

“Just wanted to thank you for the wonderful adventures Harry had all week at your camp! He came home every day with interesting stories of the things he had done. I am so glad he was a part of such a positive learning experience.”

Gail Hovanesian, mother of Harry Hovanesian
2011 Construction Academy

“Thanks to the URITC Business Academy, I learned about a new field of business that I found interesting, supply chain management. I made that my major at URI and plan to have a career in supply chain.”

Ailton Vicente
2008 Business Academy

“The experience at the Business Academy was unforgettable and very useful. I have used that on multiple job applications and it got me a job, even though I’m only 15 years old.”

Lisa Parent
2011 Business Academy

SUMMER TRANSPORTATION INSTITUTE

The URITC’s Summer Transportation Institute had another successful year in 2011. Nineteen middle school students in each of the July and August sessions learned about highway and bridge design, construction and maintenance of roads, transportation of people and cargo, specifications, regulations, safety, and career opportunities in the transportation industry.

Each two-week session included computer training, academic enhancement activities, field trips, and student projects. The importance of teamwork and communication was emphasized through several projects, including bridge building and map reading.

Several students expressed an interest in signing up for the URITC’s high school academies the following summer.

Two students work together to glue pieces of a balsa wood bridge.

Photo by Ron Giles
The URITC’s Summer Academies for high school students were successful again in 2011. The academies were promoted at Rhode Island Construction Career Days, Engineering Career Day, on the URITC website and using Facebook. Funding was provided by RIDOT through a FHWA grant.

Construction Academy
The Construction Academy had 16 students. The curriculum included OSHA 10-hour certification, flag person certification, work zone safety, hands-on activities at the Operating Engineers Center, blue print reading, estimating, construction math, surveying and layout, and starting your own construction business.

Welding was one of the many activities at the Construction Academy.

URI Professor Chris Baxter works with a student in the Engineering Academy.

Engineering Academy
Twenty students attended the Engineering Academy. The topics that were covered included highway design, bridge design, traffic engineering, water resources, environmental engineering, geographic information systems, geotechnical engineering, reading a scale, blue print reading, surveying and layout, and preparing an estimate.

Business Academy
The Business Academy had 13 students participate. Activities included interactive classes, games and exercises, and talks from Rhode Island business leaders. Students learned about the many components of managing a company’s supply chain, including planning, purchasing, production, transportation, storage and distribution and customer service.

Business Academy students visited a local distribution plant.
There were 20 Construction Career Day (CCD) events held in the second half of 2011, making the total for the year 46. The number of students who attended the 46 events totaled 63,511, for an average of 1,381 per event.

Since the CCD program started in 1999, 467,849 students have attended events in 44 states.

In 2011, Kansas became the newest state to host a CCD event. Held in Topeka on Sept. 20, 1,245 students participated in the inaugural event.

Other states celebrated milestones in 2011. The following list includes states that hosted events this past year and reached at least the 10-event plateau.

Arizona ................. 10 New York .................44
California ................ 19 North Carolina .......29
Colorado ................. 13 Ohio .....................10
Florida .................... 23 Oklahoma .............10
Idaho ...................... 15 Oregon .................17
Massachusetts .......... 14 Rhode Island ............12
Missouri .................. 14 Washington .............20

Ohio’s event, like many others, has grown in scope and popularity each year. But the goal of the event has remained the same.

“We hope students learn that a career in construction is not a last resort option,” said Ohio event coordinator Tonya Beesely. “We want them to understand the opportunities for advancement and the salaries that can be earned. There are also many students who are not aware that there are college majors related to the construction industry, which opens up even more options.”

SMILE Middle School Challenge Weekend
March 30-31, 2012
Middle school students from Central Falls, Pawtucket, South Kingstown, Warwick and West Warwick will spend the weekend at URI learning about engineering. The students will work in teams with URI students, faculty mentors and volunteers from local companies to design, build and test a transportation-related engineering project. The subject of this year’s project will be cranes and mag lev trains.

Rhode Island Construction Career Days
April 25-26, 2012
At Construction Career Days, high school students will receive hands-on experience with construction equipment, interact with industry professionals, learn about transportation and construction career options, and explore educational opportunities. The event will take place at the Rhode Island Department of Transportation’s Midstate Maintenance Facility.

Engineering Career Day
May 18, 2012
High school freshmen, sophomores and juniors will be introduced to careers in civil engineering through hands-on and classroom activities. The students will rotate in groups through four learning labs at URI’s College of Engineering:

- Bridge/Geotechnical Engineering
- Traffic Engineering & Highway Design
- Field Survey/GIS/Asset Management
- Water Resources/Environmental/Hazardous Material
Rhode Island Technology Transfer Center

In the second half of 2011, the Rhode Island Technology Transfer Center continued to offer workshops to help public works and transportation officials perform their jobs better, with an emphasis placed on safety. Here is a sample of the workshops offered.

Safety
Highway Work Zone Safety
Chain Saw Skills and Safety
Bucket Truck Safety
Safe Driver Training
Flagger Certification
OSHA 10-Hour Construction

Job Performance
Managing Stormwater in Tough Budget Times
Pavement Preservation
Introduction to Welding
Introduction to Snow Fighting
Time Management
Dealing with Setbacks
Computer Training: Word, Excel, Access

Roundtable Discussions
Hurricane Irene
Winter Operations

The Rhode Island Public Works Association Equipment Show was held Sept. 14 at the Washington County Fairgrounds in Richmond, RI. It’s a great opportunity each year for vendors to show off and demonstrate vehicles and equipment that are commonly used in public works.

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