Story Tips From The Department Of Energy's Oak Ridge National Laboratory, October 2011

EurekAlert

To arrange for an interview with a researcher, please contact the Communications and External Relations staff member identified at the end of each tip. For more information on ORNL and its research and development activities, please refer to one of our Media Contacts. If you have a general media-related question or comment, you can send it to news@ornl.gov [1].

RACING -- Green checkered flag . . .

Getting to the finish line quickest with the least environmental impact is what's driving the Green Racing initiative that has made its way to Oak Ridge National Laboratory. Through the program, fans of racing and the environment are learning about fast cars, energy efficiency and emissions. "Green Racing incorporates a scoring formula that takes into account the amount of fuel consumed, the number of laps completed, speed, energy efficiency and the amount of greenhouse gases emitted during the race," said ORNL's P.T. Jones, who heads the project for the Department of Energy. Making the learning more fun is the Green Racing Simulator, developed at Argonne National Laboratory. The simulator provides an arcade-like experience and generates a score based on information that mirrors the metrics of the Green Challenge competition. Jones noted that another goal is to support industry's efforts to accelerate the transfer of efficient automotive technologies from the track to the driveway. [Contact: Ron Walli, 865-576-0226; wallira@ornl.gov [2]]

SENSORS -- Detection from afar . . .

A new instrument able to detect chemical residues from a distance overcomes a number of problems that have plagued laser-based detectors of the past, according to Marissa Morales of Oak Ridge National Laboratory's Measurement Science and Systems Engineering Division. Using a tunable mid-infrared quantum cascade laser and an infrared camera, Morales and colleagues were able to identify as little as 5 micrograms per square centimeter of an explosive residue on a stainless steel surface. The ORNL system avoids safety problems associated with high-power lasers and approaches that require the laser to methodically scan a large area, a slow process. ORNL's technique also avoids problems of interference in the infrared region from background material. [Contact: Ron Walli, 865-576-0226; wallira@ornl.gov [2]]

SOFTWARE -- BitTorrent tracker . . .

People who engage in illegal activities using the file sharing capabilities of BitTorrent could one day face prosecution because of a technology being developed

at Oak Ridge National Laboratory. Raymond Borges of the Computing and Computational Sciences Directorate is creating software tools to monitor BitTorrent traffic and find producers of illicit material such as child pornography. While law enforcement agencies have tools to monitor abusers who use software like Gnutella to download this material, the real goal is to find the producers. BitTorrent, which was designed for deception, poses a significant challenge, said Borges, because its users usually go undetected. [Contact: Ron Walli, 865-576-0226; wallira@ornl.gov [2]]

CYBERSECURITY -- One step ahead . . .

Sophisticated hackers who have enjoyed recent success infiltrating high-profile companies might not have been so fortunate if a new Oak Ridge National Laboratory system had been in place. The patented technology developed by Nathanael Paul's team introduces true randomness generated by a quantum physical process to overcome a vulnerability in the conventional two-factor authentication process. "The log-in process where users may employ a user ID-password combination is prone to someone trying to guess a password," Paul said. "If just one user's password is compromised this can potentially make an entire organization vulnerable." Even more advanced systems that require a user to know a password and have a hardware token that displays periodic values used during a log-in can fall prey to sophisticated hackers. [Contact: Ron Walli, 865-576-0226; wallira@ornl.gov [2]]

NANOCOMPOSITES -- Neutrons pierce polymers . . .

Industrial users from DuPont in Wilmington, Del., are working with neutron instruments at the Spallation Neutron Source and High Flux Isotope Reactor to solve materials problems that can't be solved in any other way. The materials industry researchers are confident their work at Oak Ridge National Laboratory will lead to significant developments in new materials for multiple industrial applications. Nanocomposites, in which nanoparticles of many varieties are uniformly dispersed in a polymer matrix, appear to have significantly improved properties over pure polymers. Using SANS [small-angle neutron scattering] at HFIR and the EQ-SANS [extended Q-range small angle neutron scattering diffractometer] at the SNS, detailed neutron science studies are being made of when, how and why nanoparticles improve the polymers. ORNL helps industry researchers get started with a well-defined route to information and onsite expertise to help them plan experiments, write proposals and analyze their data. [Contact: Deborah Counce, 865-574-0644; councedm@ornl.gov [3]]

COATINGS -- Time to breakdown . . .

In medical treatment, doctors often prefer to deliver multiple therapeutic compounds to parts of the human body by varying the coatings on the drugs so they are released in a time-resolved manner. Researchers using the liquids reflectometer at Oak Ridge National Laboratory's Spallation Neutron Source are studying how to build coatings in which polymer layering will hold until drugs reach that part of the body for which they are intended. Faster at data collecting than any

other neutron instrument at ORNL, the liquids reflectometer has successfully taken snapshots, in close to real time, of how the multilayered structures can be changed for different applications when researchers modify their structure and function parameters. They are starting to move now from a two-dimensional road map of the structure/function relationship to a 3-D space parameter: specific initial applications that are the first steps toward medical applications. [Contact: Agatha Bardoel, bardoelaa@ornl.gov [4]]

SOURCE [5]

Source URL (retrieved on *08/02/2014 - 3:18am*):
http://www.chem.info/news/2011/10/story-tips-department-energys-oak-ridge-national-laboratory-october-2011

Links:
[1] http://www.eurekalert.org/pub_releases/2011-10/mailto:news@ornl.gov
[2] http://www.eurekalert.org/pub_releases/2011-10/mailto:wallira@ornl.gov
[3] http://www.eurekalert.org/pub_releases/2011-10/mailto:councedm@ornl.gov
[4] http://www.eurekalert.org/pub_releases/2011-10/mailto:bardoelaa@ornl.gov
[5] http://www.eurekalert.org/pub_releases/2011-10/drnl-stf100411.php