

## **Story tips from the Department of Energy's Oak Ridge National Laboratory May 2010**

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](mailto:news@ornl.gov) [1].

### **MILITARY - Intelligent intelligence . . .**

In combat situations, communication is critical, and a system being developed at Oak Ridge National Laboratory would put U.S. forces in command. While existing information management systems are somewhat effective, they fall short in a number of key areas. "For openers, they do not support information on demand," said Brian Klump, co-developer of Knowledge Acquisition Ubiquitous Agent Infrastructure, or KAUI. "This is due to the inherent nature of the publisher-subscriber model, which is that no one can access the information I have unless I proactively publish it." In combat situations, that can take several hours and can mean the difference between life and death and a successful or failed mission. ORNL's Java-based mobile agent infrastructure overcomes this and several other major obstacles associated with existing systems. The work has been funded by the ORNL Laboratory Directed Research and Development program. [Contact: Ron Walli, (865) 576-0226; [wallira@ornl.gov](mailto:wallira@ornl.gov) [2]]

### **HIGHWAYS - Screening truckers . . .**

Catching violators while keeping safe truckers on schedule is the focus of a program and system recently installed at weigh stations in South Carolina and Mississippi. In the first 24 hours, the system in Mississippi helped commercial vehicle enforcement officers nab two drivers with insurance violations, three with expired registrations and three with fuel tax violations. The system will also help officers identify stolen trucks, trucks with unsatisfactory safety ratings and a number of other violations. "In seconds, officers know whether a truck and its driver pass or need to be stopped for further inspection," said David Hill of Oak Ridge National Laboratory's Computational Sciences and Engineering Division. Over the next few years, lab officials hope to install these systems at weigh stations throughout the Southeast. The project is funded by the Southeast Regional Research Initiative. (<http://www.serri.org/Pages/serri.aspx> [3]). [Contact: Ron Walli, (865) 576-0226; [wallira@ornl.gov](mailto:wallira@ornl.gov) [2]]

### **NEUTRON SCIENCE - Spallation Neutron Source adds guesthouse . . .**

Each year ORNL hosts about 3,000 guest researchers who spend two weeks or more

conducting research at the laboratory. Many of these scientists are involved in experiments that run 24 hours a day, seven days a week. This means that, to get a little shut-eye they have to shuttle back and forth to hotels in town at all hours of the day and night—not an attractive option. To make these marathon research sessions a little easier to bear, ORNL is building a Guest House just down the hill from the Spallation Neutron Source (SNS) and the Center for Nanophase Materials Sciences. Similar to a small, on-site hotel, the Guest House will have 47 units, including a mix of single and double rooms. The rooms will be equipped with the usual amenities, including televisions, microwave ovens and wireless Internet access. The proximity of the Guest House to the SNS office building will also allow guests to have easy access to the SNS cafeteria. Ground was broken for the facility in February, and the building is expected to be ready for occupancy by late winter or early spring of 2011. [Contact: Jim Pearce, (865) 241-2427; [pearcejw@ornl.gov](mailto:pearcejw@ornl.gov) [4]]

### **NANOSCIENCE - "quanta of nonlinearity" revealed . . .**

Experiments using band-excitation scanning probe microscopy at DOE's Oak Ridge National Laboratory are providing clues to the origins of unique properties of spin and cluster glasses, phase-separated oxides, polycrystalline ferroelectrics and ferromagnets that are rooted in their highly disordered structure. Studies with the new analytic method, reported in Proceedings of the National Academy of Sciences, showed that hysteresis in these nanoscale materials is directly related to the collective behavior of their disordered structures. These behaviors influence the size of the material--such as the thickness of a thin film--at which improved properties manifest. So-called "Rayleigh behaviors" and their unpredictability have a direct bearing on the ability to fabricate nanoscale materials and, eventually, to make nanoscale devices. The new observations, which were made possible by advances in scanning probe microscopy at ORNL's Center for Nanophase Materials Sciences, may result in the rethinking of 100-year-old theories behind the "quanta of nonlinearity" and properties of disordered materials. This work is funded by DOE Basic Energy Sciences CNMS user program. PIs are Stephen Jesse and Sergei Kalinin. [Contact: Bill Cabage, (865) 574-4399, [cabagewh@ornl.gov](mailto:cabagewh@ornl.gov) [5]]

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