

ORNL wins three R&D 100s

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Researchers and engineers at the Department of Energy's Oak Ridge National Laboratory have won three R&D 100 Awards, presented each year by R&D Magazine in recognition of the year's most significant technological innovations.

With these three awards, ORNL's national lab-leading total increases to 122 and is second only to General Electric. Jeff Wadsworth, lab director, noted that the honors demonstrate the relevance of research taking place at ORNL.

"I am absolutely delighted that ORNL staff members have won three more of these prestigious awards," Wadsworth said. "The fact that we have both repeat winners and first-time winners is an impressive statement about the depth of the laboratory's scientific talent."

The honors were for the following inventions:

-- SEMCO Revolution, developed by Jim Sand of ORNL's Engineering Science and Technology Division and John Fischer of SEMCO.

The Revolution is a rooftop air conditioner that can independently control humidity and temperature while delivering any specified percentage of outdoor air into commercial and institutional buildings. Compared to conventional air-conditioning hardware packages, the Revolution is more compact, cost-effective and energy-efficient. The Revolution's flexibility allows operators to easily comply with building ventilation codes and maintain specific indoor humidity levels for hospitals, theaters, hotels and schools. Better control of humidity levels

helps control mold and mildew that can cause long-term health and indoor air quality issues.

-- SensArray Integrated Wafer, developed by Robert Lauf, Don Bible and Carl Sohns of ORNL's Engineering Science and Technology Division and Wayne Renken, Earl Jensen, Brian Paquette, Jeff Parker and Jim Barnett of SensArray.

The Integrated Wafer system is a tool for monitoring temperatures during the manufacture of semiconductors. With each generation of microprocessors, circuit features are shrinking at the same time that wafer size is increasing (from 200 millimeters to 300 millimeters), and the single biggest variable influencing the profit margin of a fabrication line is the number of good die per wafer. That yield depends on maintaining precise, uniform temperatures across the entire heating-zone elements during processing. The wireless Integrated Wafer system fulfills the need for a temperature-mapping tool that collects thermal data without disturbing the environment of the highly automated modern production path. The wafer can return a contour map of temperature data to show hot or cold spots on bake plates, analyze trends in temperature and create an animated movie of temperature variations over time. Lauf, Bible and Sohns are repeat winners.

-- SeizAlert, developed by ORNL's Lee Hively and Kara Kruse of the Computational Sciences and Engineering Division, Vladimir Protopopescu of the Computer Science and Mathematics Division and Nancy Munro of the Life Sciences Division.

SeizAlert is a low-cost compact wearable prototype device designed to alert the wearer and medical personnel of an impending epileptic seizure. In a real-life implementation, the alerting device would obtain electroencephalogram data from wireless sensors on the wearer's scalp and transmit that data to a device that interprets this information in real

time. Because epilepsy afflicts millions of people in the United States alone and many cannot be treated with medication or surgery, SeizAlert has significant medical, scientific and economic importance. Protopopescu is a repeat winner.

Source: ORNL

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