Once penniless, Sandia researcher is 'most promising'.

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Research Highlights . . .

DOE Pulse

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Labs' data sets validate efficiency models

The National Energy Technology Laboratory and Sandia National Laboratory are working on producing high-quality data sets to help validate a computer model that would predict the environmental performance of natural gas turbines using coal or biomass fuels. The project entails defining detailed temporal, spatial measurements in tightly controlled conditions to determine the accuracy of Large Eddy Simulation computer codes. The effort supports development of new simulation methods that can handle the complex flow and chemistry that occur when fuels are burned in gas turbines. If successful, this effort could allow for low-cost evaluation of innovative concepts needed to meet emissions targets for various fuels.

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New technology treats dairy wastes, odors

An unconventional treatment method for cow manure has been brought to Northwest dairies, where a demonstration project is showing it can convert waste lagoons into treatment facilities. The lagoons have traditionally been used to store large amounts of manure and liquid effluents from dairy herds until the wastes can be pumped onto fields where crops utilize the manure's nutrients. InStreem, developed by Battelle and brought to the region by DOE's Pacific Northwest National Laboratory, transforms lagoons into extended aeration systems, establishing conditions favorable for both aerobic and anaerobic degradation of wastes. In addition, InStreem can reduce an annoying problem common to all dairies—odor.

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NREL's team continues work with Avant!

At DOE's National Renewable Energy Laboratory, the Center for Transportation Technologies and Systems' battery thermal management (BTM) team is working with integrated-circuit software maker Avant! to incorporate lithium-ion, NiMH, and lead-acid battery models in Saber, a computer program used to model electrical circuits. The BTM team plans to develop a battery pack model in Saber capturing individual battery behaviors such as voltage, state of charge, capacity, power, and temperature. The team will use the Saber battery models in conjunction with the vehicle systems simulation tool ADVISOR to evaluate the impact of battery to battery variability on vehicle performance. Results are expected by the end of October.

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Spinach protein offers hope for blind

Spinach, touted by Popeye for its ability to strengthen the body, may prove even more valuable for restoring vision. Researchers at DOE's Oak Ridge National Laboratory and the University of Southern California hope to learn whether a protein from spinach could replace a non-functioning light receptor in the eye. The project is geared toward people who suffer from age-related macular degeneration or retinitis pigmentosa. Although the neural wiring from the eye to brain is intact in people with these diseases, their eyes lack photoreceptor activity. The researchers propose replacing these non-functioning photoreceptors with a spinach protein that gives off a small electrical voltage after capturing the energy of incoming photons.

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