



Livermore's Cooper has made his mark on IT.

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Research Highlights . . .

Labs, university team toward better mouse imaging

At DOE's [Thomas Jefferson National Accelerator Facility](#), new cutting-edge research for nuclear imaging of small animals has begun in collaboration with DOE's [Oak Ridge National Laboratory](#) and [Johns Hopkins University](#). The goal of the collaboration is the development of instrumentation that will allow biomedical researchers to study mice with nuclear medicine imaging techniques while the mouse is awake and unrestrained during imaging. The novel technology should offer neural scientists the opportunity to use conscious mice to study neural processes in real-time and over an extended period.

[Katie Showalter, 757/269-6206, kshowalt@jlab.org]

Pit Viper takes bite out of worker radiation exposures

Radiation exposure to personnel working in highly contaminated nuclear tank waste equipment pits may be reduced by as much as 75 percent thanks to the Pit Viper, a remotely operated cleanup system developed by DOE's [Pacific Northwest National Laboratory](#). The Pit Viper consists of a hydraulic manipulator arm, which is capable of lifting 200 pounds while fully extended, mounted on a backhoe. A variety of tools can be attached to the manipulator's gripper to perform cleanup, repair and maintenance tasks. The tool is operated remotely from a console in a trailer located up to 200 feet away from the equipment pit. The operators view cleanup activities on television monitors.

[Geoff Harvey, 509/372-6083, geoff.harvey@pnl.gov]

Plasmas steer particle beams

Working at DOE's [Stanford Linear Accelerator Center](#), physicists from UCLA, the University of Southern California and SLAC recently used charged-particle plasmas to [deflect powerful beams](#) of high-energy electrons. A plasma is created just before the beam arrives by shining an intense laser beam upon lithium vapor, stripping electrons from its atoms. As it bores through the resulting electrically charged cloud, asymmetries in the plasma divert the beam slightly. The researchers observed deflections of almost 0.1 degree and expect to do substantially better. Once the technique is perfected, it could provide a completely new way to steer particle beams without having to employ magnets.

[E. Michael E. Riordan, michael@SLAC.Stanford.EDU]

Software transforms desktop computers into supercomputer

A computer program that can turn a collection of off-the-shelf desktop computers into one of the world's fastest supercomputers has been released to the public by DOE's [Sandia National Laboratories](#). Neil Pundit, manager of Sandia's Scalable Computing Systems group, says the release of [Cplant™ system software](#) will allow researchers free access to the body of research and development that created the most scalable, Linux-based, off-the-shelf computer available. He says the hope is that modifications made by researchers elsewhere will enrich the system software, and that those improvements will come back to Sandia. The software can be downloaded from the Cplant website at <http://www.cs.sandia.gov/cplant/>.

[Howard Kercheval, 505/844-7842, hkerch@sandia.gov]

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