LIVERMORE LAB
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Feb. 27-March 2, 2012

PLoS one SLEEPING WITH THE FISHES

Adult Chinook salmon returning to a northwest U.S. hatchery. Photo courtesy of the National Oceanic and Atmospheric Administration.

Wild salmon aren't just sleeping with their own – they're sleeping with more and more hatchery salmon.

New research shows that there are so many hatchery-raised Chinook salmon spawning in the Mokelumne River that the “so called” wild fish are hardly wild at all. According to the new report, about 10 percent of the fall-run Chinook that spawn in the river are naturally born fish. If, as researchers suspect, this has been happening for years, all of the fish in the river have a parent or recent ancestor that came from a hatchery.

The research team, made up of Lawrence Livermore scientist Peter Weber and collaborators, identified hatchery fish using a novel technique, developed in part at the Laboratory. The technique detects traces of a hatchery diet preserved in the ear bones of adult fish.

By analyzing the sulfur isotopes in adult Chinook salmon ear bones, called otoliths, which were deposited during their juvenile years, Weber and colleagues were able to determine whether individuals were produced in hatcheries or naturally in rivers. The result showed that only 10 percent of adults spawning in the river had ear-bone sulfur ratios characteristic of naturally produced salmon.

To read more, go to the *PLoS One*.

THE FUTURE OF AMERICA

Brig. Gen. Sandra E. Finan addresses cadets at ROTC Day

Approximately 80 ROTC cadets, midshipmen and cadre from California, Oregon, Nevada and Arizona attended the recent ROTC Day at the Laboratory. The event helps strengthen the relationship between the National Nuclear Security Administration, the Laboratory and the Department of Defense.

The cadets toured the National Ignition Facility, the National Atmospheric Release Advisory Center and the High Explosive Application Facility (HEAF).

ROTC day is part of the Lab's Military Academic Research Associates ROTC Intern program. The program is a hands-on opportunity for undergraduate cadets and midshipmen. Research assignments are available for cadets and midshipmen who finish their course requirements early, prior to starting their military obligations. During past summers, seven to 10 ROTC interns worked at the Lab.

To read more, go to the NNSA Website.

NUCLEAR SLEUTH

Artie Rodgers

Lab geophysicist Artie Rodgers has received an award from the Defense Threat Reduction Agency (DTRA) for his work in nuclear forensics.

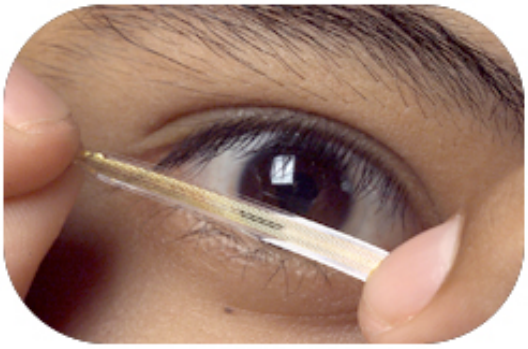
A researcher in the Atmospheric, Earth & Energy Division, Rodgers was named the "top contributor of the quarter" for the first quarter of fiscal year 2012 (October-December 2011) for a forensic analysis project.

Funded by DTRA, the program seeks to develop methods for improved forensic analysis of signals, such as sound and light, from nuclear explosions. Prompt signals are the transient phenomena created by an explosion, whether a chemical high explosive, nuclear weapon or radiation dispersal device.

As LLNL's part of the program, Livermore researchers and engineers are developing the "integrated yield determination tool," a software package that will be used to interpret prompt speed of sound data for explosion forensics.

To read more, go to the Web.

CAN YOU SEE WHAT I SEE?



Millions of people worldwide suffer from ocular diseases that degrade the retina, the light-processing component of the eye, causing blindness. As the population continues to age, the number of Americans blinded by age-related macular degeneration (AMD) and retinitis pigmentosa (RP) will increase. Unfortunately, there are no therapeutic or curative options for these patients, and it has left them with little hope until now.

Lab scientist Sat Pannu and Tracy High School teacher Kirk Brown will present, "Restoring Sight to the Blind: Bridging the Medical Gap With Technology," this Saturday (March 3) at the fourth and final Science on Saturday lecture.

There will be two presentations at 9:30 and 11:15 a.m. at The Bankhead Theater at 2400 First St., Livermore. Seating is on a first-come, first-served basis. The talk also will be broadcast on Facebook.

To read more, go to the Web.

ENGINEERING A LITTLE FUN WITH SCIENCE

Nick Williams (left) works a little scientific magic with students by demonstrating the effects of the vacuum of outer space at the Dublin school district. Photos by Lynda Seaver/LLNL.

Engineering and the critical role it plays in science was on display at Dublin High School last week in celebration of National Engineers Week. The event featured a question and answer session with hosts from the Discovery Channel show "Mythbusters," as well as demonstrations by various engineering and science classes within the Dublin school district.

To kick off the evening, Lawrence Livermore National Security presented a check for $10,000 to the school district to support engineering curricula. Jim Bono, director of Public Affairs, presented the check to Dublin schools Superintendent Stephen Hanke, Dublin High Principal Carol Shimizu and school board member Greg Tomlinson.

The Laboratory's "Fun With Science" show, a presentation of interactive experiments, proved to be one of the more popular attractions during the evening. Discovery Center volunteer and retired Lab engineer Nick Williams guided dozens of eager-to-learn onlookers through various scientific phenomena, from states of matter to the effects of air pressure, density, electricity and more. More than 1,000 students and their parents attended the event.

To read more, go to the *Dublin Patch*.
