



Jefferson Lab's Maud Baylac.



Research Highlights . . .

Evidence for the onset of quark effects

Evidence for the onset of quark effects in a nuclear reaction has been observed for the first time at DOE's [Jefferson Lab](#). Just as urbanologists strive to locate where a city truly ends and its suburbs begin, physicists wish to find the boundary at which nucleon-based descriptions give way to quark-based ones. JLab researchers have studied the behavior of the deuteron, the simplest nucleus, one proton and one neutron. The experiment fired an electron beam at a copper target, creating high-energy photons that impinged upon a deuterium target, and broke the deuterons into their constituent protons and neutrons. The results were surprising since they disagreed with many current theoretical expectations for the onset of quark-counting-rule behavior.

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Scientists advance seed production, oil remediation

A plant growth [stimulator](#), developed with the aid of Russian scientists through a DOE program, could increase the growth rate of grasses and many broad-leaf plants by 40 percent under controlled conditions. Dye Seed Ranch of Pomeroy, Wash., recently sought technical expertise for its turf grass operation from DOE's [Pacific Northwest National Laboratory](#). The Lab linked them with Russian scientists who had developed a plant growth stimulator and an oil remediation biotechnology. The work, funded by DOE's Initiatives for Proliferation Prevention program, could shorten the current 18 months seed producers wait between planting and harvesting their first crop. Also, a microbe capable of remediation of oil-contaminated fields also may hold promise for industries looking for new methods to clean up agrochemicals.

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Lead detection instruments get field test

Instruments and methods to detect lead in housedust will get a field tryout next month in tests conducted by DOE's [Oak Ridge National Laboratory](#). Representatives from six companies will participate in the test, which will help them assess how well their field-portable gear detects lead in dust. Better and less expensive instruments can help speed the identification and cleanup of lead-laden dust in homes. "In the past, the focus was on lead chips, but the Environmental Protection Agency has been expanding its scope to look at lead dust," says researcher Roger Jenkins. The evaluation is part of the EPA's Environmental Technology Verification program to accelerate the use of innovative technologies in the field.

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Water surety study gains new urgency

A project Jeffrey Danneels has had under way as manager of Civilian Surety Programs at the Department of Energy's [Sandia National Laboratories](#) became dramatically more urgent after the Sept. 11 terror attacks on New York and Washington. His work with the Environmental Protection Agency and the American Water Works Association Research Foundation sent him recently to testify before Congress on the [vulnerabilities of water systems](#). The potential damage that could be done by attacks on water systems became more obvious with the rising concern over the discovery of anthrax infections in different parts of the country. Danneels is now planning workshops on the issue, scheduled to begin in November.

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