NONPROLIFERATION

LLNL to lead U.S.-U.K. research collaboration

Lawrence Livermore National Laboratory is heading up a new international initiative for nonproliferation research. According to a March 27 LLNL press release, the initiative, known as the Advanced Instrumentation Testbed (AIT), will support the development of detection hardware and algorithms to enable improved nonproliferation detector capabilities for remote monitoring of nuclear reactors. Sponsored by the National Nuclear Security Administration, the AIT will be built and operated as part of an ongoing nonproliferation research collaboration between national laboratories and universities in the United States and the United Kingdom.

"Our goal is to harness a largely neglected aspect of the fission process for practical purposes," said LLNL physicist and AIT principal investigator Adam Bernstein. "This . . . process results in the emission of enormous numbers of highly penetrating particles known as antineutrinos. In our testbed, we will demonstrate the capability to detect the operations of nuclear reactors at significant distances, using anti-neutrino emissions. One of the key components of the testbed, the WATCHMAN antineutrino detector [WATCHMAN is an acronym for the WATer CHerenkov Monitor of ANti-neutrinos], will perform reactor monitoring at about 25 kilometers [about 15.5 miles]. This demonstration will lay the groundwork for larger detectors that would be required to monitor or discover small reactors at distances of up to several hundred kilometers."

Photo: Science and Technology Facilities Council

The Boulby Mine, home of the Science and Technology Facilities Council's Boulby Underground Laboratory, is expected to be the site of the Advanced Instrumentation Testbed.

Bernstein

The AIT will be built at the site of the Science and Technology Facilities Council's Boulby Underground Laboratory, a U.K. government–funded deep underground science facility operating at the Boulby Mine, a working potash, polyhalite, and salt mine located on the northeast coast of England. The WATCHMAN