Lawrence Livermore National Laboratory

2009 Award Winner

Gamma-Ray Spectroscopy in the Palm of Your Hand

GeMini is a portable detection device that significantly advances the field of gamma-ray spectroscopy. Its design depends on the element germanium for accurately detecting and identifying radioactive materials and incorporates an innovative ultraminiature cooling system with an infrared shielding mechanism developed at Livermore.

Resolution Is Crucial for National Security

The portable instrument can easily be carried by first responders to determine radiation levels and identify isotopes at sites of nuclear incidents. International safeguards personnel can use the detection device to inspect nuclear facilities, and homeland security personnel can use it to help prevent terrorists from smuggling nuclear materials into the country. GeMini's extremely low power consumption, small size, and low cost enable it to excel in applications where rapid deployment and portability are important.

New Applications for Spectroscopy

GeMini could be useful to civilian first responders in the case of a natural disaster if a concern of radioactive contamination exists. U.S. military personnel could find the detector useful when responding to potential terrorist threats involving nuclear weapons or dirty bombs. A version of GeMini on NASA's MESSENGER spacecraft is currently collecting the first-ever gamma-ray data from the planet Mercury.

Development team for GeMini (from left): Dennis Carr, Morgan Burks, Marianne Ammendolia, and Livermore retiree Del Eckels.

R&D 100

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