

UNH, Michigan Aerospace Corp to bring radiation detector to market

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Scientists from the University of New Hampshire and the Michigan Aerospace Corporation have signed an exclusive option agreement to commercialize instrumentation originally developed at UNH's Space Science Center for space-based missions and now being re-engineered for homeland security purposes.

Three U.S. patent applications have been filed related to the Portable Neutron Spectroscope, or NSPECT, a highly sensitive [instrument](#) that will detect illicit radioactive and fissile (capable of sustaining a chain reaction) materials with pinpoint accuracy from a safe distance. Such materials, which could be located in shipping ports, train stations, truck stops or warehouses, could potentially be used to make "dirty bombs" or associated with a nuclear device itself.

To build the instrument, UNH is leveraging 40 years of experience conducting space-based neutron and gamma-ray detection, with university scientists and engineers developing all the related instrument hardware and software. Michigan Aerospace is responsible for the support engineering that will turn the bench-top instrument into a rugged field-deployable device equipped with a nimble [graphical user interface](#) and live video imaging capability.

A Phase III Small Business Innovation Research contract with the Defense Threat Reduction Agency (DTRA) has been instrumental in enabling development of the technology. DTRA is the U.S. Department of Defense's official combat support agency for countering weapons of

mass destruction.

NSPECT employs the same techniques used by the NASA Compton [Gamma Ray Observatory](#), a mission that involved UNH scientists and looked at radiation emanating from black holes, [solar flares](#), gamma-ray bursts, and pulsars.

Says professor James Ryan of the UNH Institute for the Study of Earth, Oceans, and Space and principle scientist for NSPECT, "Basically, what people have to do now is go into a building or a container and fish around in hopes of finding the source. The expertise that has been acquired over many years in the space program can now be brought to bear on this problem to better find and locate nuclear bomb-making material."

Common radioactive sources emit gamma rays while nuclear bomb material emits both gamma rays and neutrons. Because neutrons and gamma rays are electrically neutral, it is difficult to ascertain properties like direction of origin or energy level of the radioactive source. Knowing the direction allows inspectors to pinpoint the location of the illicit material while the particle's energy provides important information about the nature of the material such as what radioactive isotope is emitting the radiation.

"Michigan Aerospace is pleased to work with UNH on accelerating the commercialization of this technology and moving toward a product that can be deployed in the field," says Peter Tchoryk, CEO of Michigan Aerospace, "NSPECT is a unique technology that is critical to protecting the country from nuclear threats."

The completed instrument will fit in the back of an SUV and be self-powered and remotely controlled. The image and spectral signature data will be collected and processed on a laptop located either near the

instrument or at a distance. Compact versions of the instrument are also planned.

The patent applications apply to three aspects of the technologies developed at UNH: the neutron and gamma-ray detection system that allows a full, 360-degree survey of a room or volume without having to move the instrument; an innovative power supply that is highly efficient and compact thereby allowing the detector to be modular and robust; and the NSPECT instrument itself. The SSC inventors include Ryan, John Macri, Mark McConnell, Ulisse Bravar, and Christopher Bancroft.

"The partnership with Michigan Aerospace to bring this innovative technology to market will capitalize on a longstanding research relationship between our two organizations," says Maria E. Emanuel, senior licensing manager with the UNH Office for Research Partnerships and Commercialization.

Provided by University of New Hampshire

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