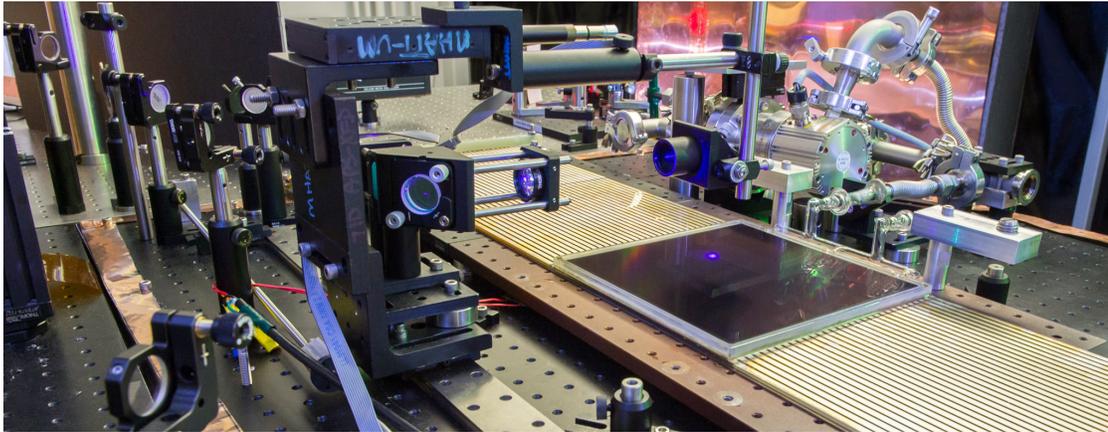


Commercialization target set for larger, more precise photodetectors to aid science, security and healthcare



A 4 by 4 foot detector panel is examined in a test lab at Argonne National Laboratory. The new design, named a Large Area Picosecond Photodetector, provides high-quality lower cost imaging for use in cargo scanners, neutrino experiments and medical devices.

Scientific particle detectors, medical imaging devices and cargo scanners with higher resolutions and cheaper price tags could soon become a reality, thanks to the development of a microchannel plate (MCP) photo detector system. This improves image resolution by a factor of 20 to 100, depending on the type of detector, and reduces manufacturing costs, making commercialization viable.

Currently, many detector systems rely on the cheaper photomultiplier tube detectors, but these have poorer spatial and temporal imaging resolutions. The Large Area Picosecond Photo detector collaboration (LAPPD) makes MCPs a viable alternative by developing away to construct mass-produced MCPs using inexpensive window glass and a unique coating technology.

Impact

Massachusetts-based fiber optics company Incom Inc. has partnered with LAPPD to develop prototypes with the aim of making the manufacturing of MCPs cheaper and easily scaled up. This will produce MCPs in larger sizes and quantities and make the more efficient detectors financially viable for a broader community.

Photo detectors are essentially light sensors and have a broad array of applications. In X-ray science, these detectors can help researchers design new pharmaceuticals, create new catalysts and hunt for defects in materials and manufacturing processing. In particle physics, photo detectors record the type and path of subatomic particles, such as neutrinos, to allow researchers to learn more about the building blocks of matter and how the universe evolved. Photo detectors are also used in homeland security to scan large shipping containers, and in hospitals to provide medical imaging technology, such as Positron Emission Tomography (PET) scanners.

Partners

LAPPD project is an interdisciplinary group of scientists in high-energy physics, radiology and electrical engineering based at Argonne, Berkeley and Fermi National Laboratories, and the University of Chicago. At Argonne, the project includes scientists from the High-Energy Physics (HEP) and Energy Sciences (ESD) divisions, and the Advanced Photon Source (APS).

INCOM Inc. is working with the LAPPD team through the Small Business Technology Transfer (STTR) and Small Business Innovation Research (SBIR) programs created by the Department of Energy (DOE).

Funding

U.S. Department of Energy

More Info

Project website: <http://psec.uchicago.edu>
Incom website: <http://incomusa.com/>

Timeline

The LAPPD work started in 2009. Incom Inc. joined the partnership in 2009. Incom Inc. expects to produce the first prototypes in late 2013.