

APR12-2012-001032

Abstract for an Invited Paper
for the APR12 Meeting of
the American Physical Society

The large-area picosecond photo-detector (LAPPD) project¹

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The technological revolution that replaced the bulky Cathode Ray Tube with a wide variety of thin, reduced-cost display technologies, has yet to be realized for photosensors. Such a low-cost, robust and flexible photon detector, capable of efficient single photon measurement with good spatial and temporal resolution, would have numerous scientific, medical and industrial applications. To address the significant technological challenges of realizing such a disruptive technology, the Large Area Picosecond Photo-Detector (LAPPD) collaboration was formed, and has been strongly supported by the Department of Energy. This group leverages the inter-disciplinary capabilities and facilities at Argonne National Laboratory, the Berkeley Space Sciences Laboratory (SSL), electronics expertise at the Universities of Chicago and Hawaii, and close work with industrial partners to extend the known technologies. Advances in theory-inspired design and in-situ photocathode characterization during growth, Atomic Layer Deposition (ALD) for revolutionizing micro-channel plate fabrication, and compact, wave-form sampling CMOS ASIC readout of micro striplines are key tools toward realizing a viable LAPPD device. Progress toward a first 8" x 8" demonstrator module will be presented.

¹Work done with LAPPD (Large Area Pico-second Photo-Detector Collaboration).