

## **Arradiance Achieves First Cryogenic Microchannel Plate Detector Capable of MHz Signal Rate**

Mon Jan 7, 2013 8:30am EST

### **Latest development applies patented nanofilm technology to vital cryogenic applications enabling noiseless, low signal amplification**

In an industry first, Arradiance, Inc. announced today, the demonstration of cryogenic Microchannel Plate (MCP) devices operating at  $M\Omega$  resistances, enabling MHz data acquisition rates.

"This is the first time that MCP devices have been targeted to operate at these high data rates at temperatures on the order of 10 degrees Kelvin," said Neal Sullivan, CTO Arradiance. "Presently available commercial MCP devices are severely limited by the reduced silicon lead glass (RSLG) that determines the device conductivity to operation in the kHz data regime. Our patented, functional nanofilms which allow for precise targeting of conductivity over many orders of magnitude enable this significant achievement."

The patented nanofilms that are at the heart of this new device capability are deposited using Atomic Layer Deposition (ALD), a technique that allows for sub-angstrom-level control over nanofilm composition and thickness. By engineering the materials at this sub-atomic level, fine control over electrical and electron emissive properties is achieved. This work has extended the capability of these nanofilms to the cryogenic regime.

Research applications for this technology include cryogenic electrostatic ion-beam storage work being performed at the Department of Physics, Stockholm University in Sweden. "In these studies a major experimental challenge is to detect fast ions and neutrals at low temperatures and high rates," said Physics Professor Henning Schmidt, Stockholm University. "The news of efforts to make MCPs with very different, more favorable properties at low temperatures is very exciting from our perspective as it may potentially completely eliminate what is now the single most severe limitation for the planned experiments at our new double-storage ring facility."

"Our conductive nanofilms are the critical technology for MCP substrate independence, enabling noiseless, high gain detectors to achieve the very large areas required for advanced scientific, homeland security and medical imaging markets," said Ken Stenton, CEO of Arradiance Inc. "This cryogenic capability further extends the reach of our technology and opens new commercialization opportunities in biomedical and drug discovery research applications, where fluorescence photons, which must be detected with high temporal resolution, can benefit from the significant intrinsic noise reduction provided by operation at cryogenic temperatures."

In addition to having designed and developed the ALD process equipment for these functional nanofilms, Arradiance also holds patents that apply to substrate formation and composition as well as integrated detector systems. This suite of intellectual property allows for full productization of the enabling nanofilm technology.

### **About Arradiance**

Arradiance is enabling us to better perceive the hidden world all around us. Their process equipment and functional thin film devices greatly enhance the performance of imaging and detection systems, providing resolution, gain and lifetime improvements that were previously unattainable. Founded in 2003, Arradiance, a privately-held Massachusetts based product and technology company, is committed to bringing novel solutions to difficult nanotechnology problems.

**Learn more at [www.arradiance.com](http://www.arradiance.com)**

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