

**For Release on January 26, 2010**

## **Breakthrough Back-Illuminated CCD and EMCCD Detector Technology Sets a New Standard for Sensitivity**

**Princeton Instruments (Trenton, USA), e2v (Chelmsford, UK), and Photometrics (Tucson, USA) are pleased to announce the launch of new eXcelon™ back-illuminated charge-coupled device (CCD) and electron-multiplication CCD (EMCCD) detector technology that is ready to revolutionize scientific imaging and spectroscopy. Princeton Instruments will introduce several new cameras based on this exclusive technology during the 2010 Photonics West Conference, January 26–28.**

New eXcelon sensors provide excellent photon-detection capabilities across a wide spectrum, from 200nm to 1100nm, and are particularly beneficial for applications requiring enhanced sensitivity in the Blue and near-infrared (NIR) region. In addition, eXcelon back-illuminated sensors significantly reduce etaloning, the problematic appearance of fringes due to constructive and destructive interference in the device's back-thinned silicon while imaging in the NIR region (750-1100nm).

Until now, researchers interested in NIR imaging were compelled to use either front- or back-illuminated, deep-depletion CCDs. Each of these device architectures, however, has drawbacks. Front-illuminated sensors, for instance, have 2x to 3x lower sensitivity than their back-illuminated counterparts, while the utility of deep depletion sensors is ultimately hindered by 100x greater dark current. By contrast, eXcelon sensors not only counter etaloning, they also boast ~90% peak quantum efficiency and do not increase dark current.

When eXcelon technology is applied to popular EMCCD devices, the result is a detector with sub-electron read noise, superb sensitivity, low dark current, little if any etaloning, and high frame rates – a combination unmatched in the world of CCD/CMOS sensors.

New eXcelon technology will be featured in Princeton Instruments' PIXIS and ProEM deep-cooled cameras and is available in several pixel-array formats: 1340x100 and 1340x400 CCD cameras for spectroscopy, as well as 512x512 to 2048x2048 CCD cameras for imaging. The technology is also available in 512x512 and 1024x1024 ProEM EMCCD cameras. These new eXcelon-enabled cameras will target a wide variety of applications in both the life sciences and physical sciences. Examples include astronomy, Raman spectroscopy, live-cell imaging, confocal imaging, Total Internal Reflection Fluorescence Microscopy (TIRFM), Förster Resonance Energy Transfer (FRET), Bose-Einstein Condensate (BEC) imaging, solar cell inspection, as well as super resolution techniques such as STORM and PALM.

“As premier suppliers of scientific imaging and spectroscopy instrumentation, Princeton Instruments [PI] and Photometrics each have a long history of innovation,” commented Don Templeman, President of Princeton Instruments. “The eXcelon sensors are a direct result of listening to the world’s leading researchers in life and physical sciences. The creative team of application scientists and engineers at PI, Photometrics, and e2v have delivered a truly innovative detector technology that is set to advance many optical diagnostic techniques.”

“New eXcelon technology is a testament to collaboration between image sensor designers and manufacturers like ourselves and camera manufacturers like PI and Photometrics,” explained Brian McAllister, General Manager of Imaging at e2v. “For example, for a long time, it has been known that etaloning in the near-infrared region is a significant problem in back-illuminated CCDs. The remarkable solution incorporated in eXcelon sensors came about only after many debates and research trials. We are very pleased that e2v has been able to contribute to yet another key breakthrough in photonic detector technology.”

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Princeton Instruments designs and manufactures high-performance CCD, ICCD, and EMCCD cameras; spectrographs; and optics-based solutions for the scientific research, industrial imaging, and OEM communities. We take pride in partnering with our customers to solve their most challenging problems in unique, innovative ways. Princeton Instruments is a registered ISO 9001: 2008 company. For more information on Princeton Instruments products, please visit [www.princetoninstruments.com](http://www.princetoninstruments.com).

**About e2v** - 106 Waterhouse Lane, Chelmsford, Essex CM1 2QU UNITED KINGDOM

e2v’s objective is to be a global leader in the design and supply of specialized components and sub-systems that enable the world’s leading systems companies to deliver innovative solutions for the medical & science, aerospace & defense, and commercial & industrial markets. The company is headquartered in the United Kingdom and has approximately 1700 employees in six production facilities across Europe and North America. e2v also operates a global network of sales and technical support offices, supported by local distributors and resellers. Further information is available at [www.e2v.com](http://www.e2v.com).

**About Photometrics** - 3440 E. Britannia Drive, Tucson, AZ 85706 USA

Founded in 1978, Photometrics is the world’s premier designer and manufacturer of high-performance CCD and EMCCD cameras for the life sciences. The original architect of the world’s 1st scientific grade microscopy EMCCD camera, tens of thousands of researchers across the globe rely on Photometrics’ state-of-the-art imaging instrumentation, including its popular CoolSNAP™, Cascade®, QuantEM® and Evolve™ cameras to meet their most demanding application requirements. Photometrics also offers comprehensive OEM support, including fully characterized, cost- efficient imaging systems and components that offer the best solutions for customers’ unique requirements. Photometrics is a registered ISO 9001:2008 company. For more information, visit [www.photomet.com](http://www.photomet.com)