

## **Techniques for Nanoscale Materials Development**

To meet today's nanoscale materials development challenges requires continuing advancements in imaging and analysis techniques that allow you to keep pace with your characterization requirements. This workshop will focus on two important technologies for materials research:

### **Applications results with ChemiSTEM Technology:**

Application examples will be shown from both the FEI Titan G2 and Tecnai Osiris platforms, including new application examples demonstrating EDX Tomography from several different samples including semiconductor devices, steels, and energy materials such as LEDs and catalysts. Atomically resolved EDX maps used to solve problems in III-V semiconductor devices and quantum well composition will also be shown. ChemiSTEM Technology is an EDX technology that can achieve mapping speeds and sensitivities up to 50x greater than conventional technology, greatly improved tilt-response, and enhanced light element detection capability. The architecture consists of 4 windowless SDD EDX detectors, fast mapping hardware and software capable of 100,000 spectra/second in EDX mapping, and the X-FEG high-brightness schottky electron source. This system has been shown to provide maps of catalyst core-shell nanoparticles, resolved in just minutes, as well as detection of very low concentrations down to the range of 0.02 wt.%.

### **The XHR SEM: Latest advances and new perspectives**

The XHR SEM (extreme high resolution scanning electron microscope) has become the instrument of choice for studying the surface of materials at the true nanoscale, with minimal requirement on the sample preparation and fast time to result. In this workshop, we will review the latest and new methods and technologies related to the XHR SEM, that allow you to work on a wider range of samples, including samples that are beam sensitive or non-conductive, and access even more precise characterization of the surface properties. Examples in various fields, such as materials science and semiconductor, will be provided.