

*Connecting the global minerals, metals, and materials community.*



## **Plan Now to Attend:**

### **Characterization of Materials through High Resolution Coherent Imaging**

This symposium will provide a venue for presentations regarding the use of coherent diffraction imaging techniques (x-ray and electron diffraction imaging, ptychography, holography) and phase contrast imaging techniques for high-resolution characterization in all classes of materials.

A high degree of spatial coherence is an attractive property in x-ray and electron beams. Those from modern synchrotrons and electron microscopes have enabled the development of novel imaging methods. In some cases, these imaging methods provide resolution beyond that achieved with optics (<10nm) and can also provide remarkable sensitivity to a variety of contrast mechanisms. The two methods that will be the focus of this symposium are coherent diffractive imaging (CDI) and phase contrast imaging (PCI). Both explicitly take advantage of the coherence properties of the incident beams. CDI has rapidly advanced in the last fifteen years to allow characterization of a broad range of materials, including nanoparticles, strained crystals, biomaterials and cells. PCI has been widely employed in dynamics and engineering studies of materials, geophysics, medicine and biology. Various techniques making use of both x-rays and electrons have been developed that provide unique characterization abilities such as three-dimensional strain mapping and non-destructive three-dimensional tomographic imaging. Areas of interest include, but are not limited to:

- All x-ray based techniques including Bragg CDI, Fresnel CDI, ptychographic CDI, propagation phase contrast imaging, interferometry imaging, and analyzer-based phase-contrast imaging
- All electron-based techniques including ptychography and electron CDI
- All structural and functional materials systems
- Industrial applications
- Development of new techniques and new sources

#### **Sponsored by:**

- TMS Extraction & Processing Division
- Materials Characterization Committee

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