

Short Abstract:

In my talk I will demonstrate the application of electron beam techniques to study the microstructure-property correlation in ferroelectric thin films (e.g.  $\text{PbSc}_{0.5}\text{Ta}_{0.5}\text{O}_3$ ) and  $\text{MgB}_2$  superconductors and also to reveal the mechanism of metal induced crystallization in Si thin films. A judicious combination of the following advanced electron beam techniques will be presented (i) high resolution imaging in transmission electron microscope (TEM), (ii) Diffraction contrast imaging in TEM, (iii) Energy dispersive x-ray spectroscopy in scanning electron microscope (SEM) and TEM, (iv) Electron energy loss spectroscopy in TEM (v) In-situ heating in TEM.