

Transmission Electron Interferometric Methods for Materials Characterization

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Interferometric imaging and analysis at the Transmission Electron Microscope (TEM) deliver the full information contained in the electron wave used to probe the sample. While conventional TEM characterization investigates “*which atoms are, and where*”, electron holographies, and other interferometric methods, try to answer the question: *which fields are and where?* Electric and magnetic fields in materials can be measured and mapped with sub-nanometric resolution using electron holography, while Geometric Phase Analysis and Dark Field Electron Holography can recover the full strain tensor in lattice deformations of crystalline materials. This talk will provide an overview of these interferometric methods at the TEM, describing the basic principles behind their application in different contexts of technology and materials science.