# Studies of Electron Scattering and Order Parameter Determination in Nanoscale FePt

The most readily available technique for the determination of long-range order parameter S is X-ray diffraction. Experimentally, S is determined by measuring the total integrated peak intensities of the superlattice and fundamental reflections according to kinematical scattering theory. However, X-ray scattering from thin films and nanoparticles can be very small and difficult to measure with laboratory diffractometers. In contrast, electron scattering can be more amenable for diffraction studies of small volumes, though strong interaction of electrons with the material results in multiple scattering events. As a result, the scaling of the ratio of integrated intensities is no longer valid and S determination becomes more complex. To correctly account for multiple electron scattering events, a multislice simulation is necessary to predict the convergent beam electron diffraction (CBED) intensities for a given order parameter, orientation and thickness. This talk will address these techniques for thin films and nanoparticles.