MATERIALS SCIENCE AND ENGINEERING

SEMINAR

Phase Retrieval Algorithms: Applications and Evolution of the Gerchberg-Saxton Algorithm

by

Sammy Saber
Purdue MSE Prelim 1
Dr. Eric Stach and Prof. Eric Kvam

ABSTRACT

The fields of electron microscopy and X-ray crystallography suffer from the phase problem. The phase problem is the loss of the phase information when an image is measured. In electron microscopy, the act of recording an image allows only the squared amplitude of the electron wave function to be recorded, and thus the phase information in the wave is lost. This lost phase information is important when reconstructing the electron exit wave and allows us greater understanding of electron/specimen interaction. In this presentation, I will describe and discuss the Gerchberg-Saxton algorithm (the most commonly used approach to phase retrieval), other methods of retrieving the lost phase information from a measured image, the uniqueness of calculated solutions, how the algorithm has been used in past research and how future research should implement the Gerchberg-Saxton algorithm.

Date: Tuesday, November 8, 2011
Time: 3:30pm
Place: ARMS 1028

PURDUE MSE