

MILLER ENDOWED LECTURE

Unveiling the structure of amorphous materials with coherent electron diffraction

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Room 118 Nieuwland Science Hall

Refreshments @ 3:30 in 202 NSH

Glasses and other amorphous solids are widely used for their mechanical, optical and electronic properties, yet the correlation between properties and structure is poorly understood. One missing link is “medium-range-order” (MRO) which often arises from topological atomic structure. While important to properties, MRO has been notoriously hard to study because conventional diffraction gives only short-range order. Using coherent diffraction techniques such as Fluctuation Electron Microscopy (FEM), this problem can be solved. We describe the techniques and its applications to amorphous semiconductors in detail. The use of transmission electron diffraction and x-ray diffraction is discussed. We also review some other applications, including the promise of FEM’s use in studying partially-ordered organic and biological systems.