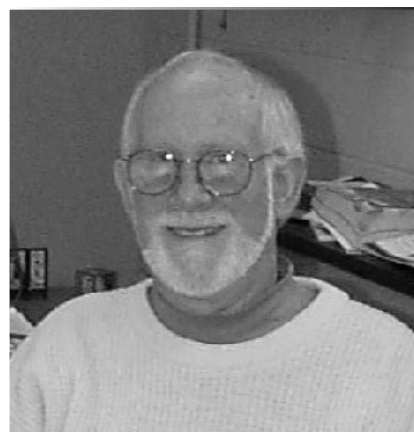


T_cSAM Bi-Weekly Brown Bag Seminar

Texas Center for Superconductivity and Advanced Materials

Dr. Simon Moss

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“Nanoscale Modulations in Optimally Doped and Underdoped YBCO: X-ray Evidence and Theory for Atomic Displacements in the Higher-Order Ortho Phases”

Friday, April 30, 2004

Room 102, University of Houston Science Center
12:00 p.m. – 1:00 p.m.

Abstract

High intensity x-ray measurements at the undulator line of the Advanced Photon Source have shown a distinct pattern of diffuse satellites about the normal Bragg peaks which possess a characteristic asymmetry and have a correlation range of only 4-5 unit cells in all directions. Measurements made at 7K show an intensity distribution about the Bragg peaks which strongly resemble those found in totally disordered tetragonal YBCO doped with Al, indicating substantial disorder within these modulated regions. An intensity fit for the optimally doped crystal reveals a pattern of modulations along the a-axis with a strong c-axis component of the Ba atoms. In the underdoped crystal, an ab initio calculation of the relaxed atoms in the modulated Ortho-V phase gives nearly perfect agreement with former experiments, leading to the unavoidable conclusion that these crystals show essentially diffusion-limited formation of imperfect Ortho phases predicted some years ago by de Fontaine and co-workers. They are thus of static origin, and have little to do with stripes, CDW's, or soft optic phonons.

Research supported by TcSAM and the NSF/DMR

Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8210 as soon as possible.

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