



Weekly Seminar

How to explore new superconductors and novel superconductivity via thin films?

Dr. Kui Jin

Institute of Physics, CAS

Time: 4:00pm, March. 19, 2014 (Wednesday)

时间: 2014年3月19日 (周三) 下午4:00

Venue: Room 607, Conference Room A, Science Building 5

地点: 理科五号楼607会议室

Abstract

In this talk, I will present our recent work on searching for new superconductors and a detailed study on spinel superconductor LiTi_2O_4 thin films.

For superconductor exploration, we tried two systems of phase spread thin films by highthroughput combinatorial techniques. The co-sputtering technique was employed to fabricate Fe-B phase spread thin films, in which we succeeded in discovering a superconducting composition. The other phase spread system, $(\text{La,Nd})\text{NiO}_3$, was synthesized by combinatorial pulsed laser deposition technique. Though we didn't see any superconducting trace in $(\text{La,Nd})\text{NiO}_3$, the period of sample growths and characterizations was shortened in 1 month, compared to 1 year for traditional methods. These results confirm the feasibility of searching for new (superconducting) materials by combinatorial thin film techniques.

LiTi_2O_4 is the only oxide spinel superconductor. Owing to the poor quality of the samples, this system hasn't been comprehended during the last 40 years. High quality LiTi_2O_4 thin films were reported by several groups recently. We carried out transport and point-contact tunneling measurements on LiTi_2O_4 thin films. For the first time, we found a novel magnetoresistance behavior and a scaling law for the field dependent superconducting

About the Speaker

Dr. Kui Jin received bachelor's degree at Wuhan University in 2003, and PhD at Institute of Physics (IOP), CAS in 2008. From 2008 to 2012, he worked as a Research Associate in Department of Physics at University of Maryland, College Park, USA. Thereafter, he joined IOP and worked in National Lab for Superconductivity. He was awarded the titles of "Hundred Talents Program" (CAS) and "Recruitment Program of Global Experts". At the beginning of 2014, he was selected as a group leader. Research in his group focuses on exploring new superconducting materials and novel superconductivity by advanced highthroughput combinatorial thin film techniques. So far, he has more than 20 publications and 7 Chinese Patents. As the first author, he has 1 Nature, 1 PNAS, 1 APL Materials, and 6 PRB.