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Baton Rouge, Louisiana 70803-4001

WEEKLY CALENDAR

October 27 - 31, 2014

DEPARTMENTAL COLLOQUIUM

"Exploring Intertwined Orders in High-Temperature Superconductors"

3:30 PM October 30, 2014
109 Nicholson Hall

John Tranquada

Condensed Matter Physics & Materials Science Department, Brookhaven National Laboratory

Host: Ward Plummer

• Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall •

Superconductivity is a remarkable state in which conduction electrons form a collective state of pairs that can flow without dissipation. The remarkably successful theory of superconductivity by Bardeen, Cooper, and Schrieffer starts by considering the conduction electrons to be highly delocalized and weakly interacting. In contrast, high-temperature superconductivity in copper-oxide compounds is achieved by chemically doping charge carriers into an antiferromagnet, where electrons are quite localized and strongly interacting. How can one fit antiferromagnetic spin correlations together with superconductivity? I will discuss a series of experiments on $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ that have led to the suggestion that, while superconductivity and antiferromagnetism do not want to coexist locally in the same region, they can be intertwined in a manner that allows them to avoid each other in real space. The apparent existence of such a state is compatible with the popular concept that antiferromagnetic spin fluctuations should be good for electron pairing, but a fundamental understanding will require an unconventional approach.

SPECIAL SEMINAR

Louisiana Consortium for Neutron Scattering

"In-situ SPM Study of Surface of Perovskite Manganites"

Zheng Gai

Oak Ridge National Laboratory's Center for Nanophase Material-Imaging and Nanoscale Characterization Group

3:00pm - 4:00pm, Monday, November 3, 2014
1008B Digital Media Center, LSU

Louisiana Consortium for Neutron Scattering

Seminar Series

In-situ SPM Study of Surface of Perovskite Manganites

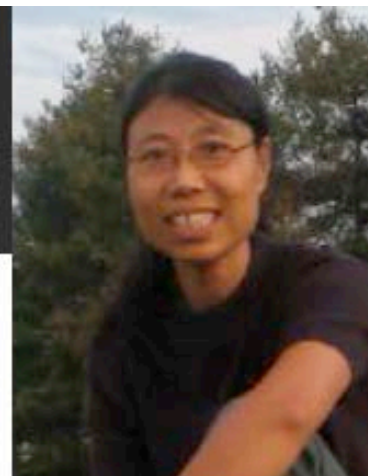
Mon, Nov 3

3:00-4:00pm

1008B Digital Media Center

Louisiana State University

ABSTRACT: The characteristic aspect of strongly correlated oxides systems is the strong coupling between the structural, electronic and magnetic properties. A small change in one property can produce a large change in another. Controllable surface tuning provides the opportunity to study how structural, electronic, and magnetic properties respond to the broken symmetry and opens avenues for exploration of completely new physical properties. The extreme sensitivity of properties to external chemical and physical stimuli makes *in-situ* characterization a requirement for controlled tuning of complex correlated materials. We report some recent progress in observations and tuning of physical and chemical phenomena on the surfaces of in situ grown, single crystalline epitaxial perovskite manganites films with different thicknesses, including atomic-level structural studies, control, and tuning of the physical properties.



Guest Speaker

ZHENG GAI

R&D Staff Scientist

Oak Ridge National
Laboratory's Center
for Nanophase
Materials - Imaging
and Nanoscale
Characterization
Group

Free and open to the public

