

# Pinaki Majumdar

## Research Summary:

My work over the last one year has been mainly on the interplay of strong coupling, phase competition, and disorder in electron systems. The manganites remain the focus, but the lessons learnt are of value in a wider class of materials. I have also worked on the problem of magnetism in the  $f$  electron metals, suggesting a framework for how the  $f$  metals evolve from standard weak coupling RKKY magnets to strong coupling 'double exchange' like systems. I have recently started work on the double perovskites, and also a cluster DMFT study of heavy fermions.

## Publications:

1. Sanjeev Kumar, Arno P. Kampf and Pinaki Majumdar, *Domain Formation and Orbital Ordering Transition in a Doped Jahn-Teller Insulator*, *Phys. Rev. Lett.* **97**, 176403, (2006)
2. Sanjeev Kumar, Arno P. Kampf and Pinaki Majumdar, *The Effect of Disorder in an Orbitally Ordered Jahn-Teller Insulator*, *Phys. Rev. B* **75**, 014209, (2007)

## Preprints:

1. Kalpataru Pradhan, Anamitra Mukherjee and Pinaki Majumdar, *The Distinct Effects of Homogeneous Weak Disorder and Dilute Strong Scatterers on Phase Competition in the Manganites*, submitted for publication
2. Kalpataru Pradhan and Pinaki Majumdar, *The Classical Kondo Lattice at Intermediate Coupling* (in preparation)
3. Kalpataru Pradhan and Pinaki Majumdar, *Magnetism Beyond the Ruderman-Kittel-Kasuya-Yosida Interaction: Revisiting the  $4f$  Metals* (in preparation)

## Conference/Workshops Attended:

1. *Mesodis*, IIT Kanpur, India, Dec 2006.
2. *Correlated systems and novel materials*, IIT Kharagpur, Jan 2007.
3. *Indo-Japan meeting on magnetoresistive oxides*, Tokyo, Feb 2007.

**Visits to other Institutes:**

1. Physical and Theoretical Chemistry Department, Oxford University, April-May 2006.
2. Institut Laue-Langevin, Grenoble, France, June-Aug 2006.

**Other Activities:**

1. Gave six lectures at a SERC School on 'Magnetism and Superconductivity' at the University of Hyderabad in Nov 2006.