

## ICTS Colloquium

Title : Emergent phenomena in correlated quantum materials

Speaker : Arun Paramakanti, University of Toronto, Canada

Date : Monday, May 8, 2017

Time : 3:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : The interplay of quantum mechanics and many-body interactions leads to remarkable emergent phenomena in crystalline solids, ranging from intricate magnetic orders to high temperature superconductivity to electronic analogues of liquid crystals. The quest to discover, understand, and control such phases of quantum materials has led to extensive research on transition metal oxides. I will present an overview of some ongoing efforts in this field: heavy transition metal oxides with strong spin-orbit coupling, surfaces and interfaces of complex oxides, and using strain as a knob to tune electronic properties. I will also discuss our theoretical efforts -- ranging from the study of model Hamiltonians to low energy effective theories to ongoing collaborative efforts with experimentalists -- which are aimed at understanding the rich physics of these materials.