Theory Needs for the ALS and Beyond

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Part I: Computation and Spectroscopy

As a result of advances in instrumentation at ALS and other DOE-supported facilities, tremendous amount of spectroscopic data are becoming available on wide classes of material systems. An increasing exploration of electronic, geometric and excitation properties of ordered and defected crystals, surfaces, interfaces, and complex nano-scale assemblies of atoms and molecules is thus enabled as a function of various external parameters such as temperature, pressure, and magnetic field. Theoretical modeling is crucially important for interpreting spectroscopic data and for developing viable physical models of novel materials and phenomena and exotic states of matter. Part I of this workshop will highlight the role of parallel theoretical modeling and the opportunities so opened up in connection with present day high throughput, high resolution work at various users facilities.

Part II: The Present and Future of Strongly Correlated Condensed matter physics

The present and future of strongly correlated condensed matter physics will be touched upon in part II of this workshop. This includes talks on cuprates, manganites, and some discussion of future new directions.

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ALS Bldg 6, Rm 2202

Agenda:
Saturday, Oct 6th

Part I: Computation and Spectroscopy

8.30 – 9:00	Welcome	
9.00-9:45	Need and Opportunities for Advanced Modeling of Spectroscopic Data	Arun Bansil Northeastern Univ
9.45:10:30	Inelastic x-ray Scattering in Cuprates: An examination of mid-to-low energy excitation.	Tom Devereaux Stanford/SLAC
10.30-11:00	Break / discussions	
11.00-11:45	TBD	Steve Louie UCB/LBNL/TMF
11.45-12:15	Simulating the x-ray absorption spectroscopy of aqueous systems	David Prendergast LBNL/TMF
12:15-13:30	Lunch/Discussion	

Part II: The Present and Future of Strongly Correlated Condensed matter physics

13:30-14:15	From Hi Tc to quantum spin liquid and back	Patrick Lee MIT
14:15-15:00	Optimal inhomogeneity for high temperature superconductivity	Steve Kivelson Stanford Univ
15:00-15:30	Break / discussions	
15:30-16:15	Beyond Landau: Novel phases and transitions in correlated quantum matter	Ashvin Vishwanath UCB/MSD
16:15-15:00	From topological insulator to spin charge separation	Dung-Hai Lee UCB/MSD
15:00-15:15	Future plan/ Concluding remarks	