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Department of Physics

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Steven Kivelson



Faculty Type:

Active Faculty

Title:

Prabhu Goel Family Professor

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Support Staff:

[Roberta Edwards](#)

[Muel Lederer](#) (principal advisor: Sri Raghu)

[Mei Nie](#) (Rotation student, Autumn 2012)

Post-doctoral Fellows:

- [Maissam Barkeshli](#) - Simons Fellow
- [Pavan Hosur](#) - SITP Fellow
- [Yi Zhang](#) - SITP Fellow

Research Interests

How do the interactions between the vastly many electrons in solids produce the emergent phenomena we recognize as macroscopic behavior of the materials we encounter in everyday life, and in the exotic materials and devices we engineer in the laboratory?

The central source of intellectual vitality and practical importance of condensed matter physics is the richness and diversity of behaviors exhibited by strongly interacting systems with many degrees of freedom, ranging from the collective behavior of neurons in the brain to the collective condensation of Cooper pairs that produce the macroscopic quantum

phenomena associated with superconducting order. The main thrust of the research carried out by Professor Kivelson is search for theoretical characterization of qualitatively new behaviors of interacting electrons (i.e., new states of matter) as well as new regimes of parameters in which familiar states of matter behave in new and different ways. In particular, he seeks to explore, qualitatively, the relation between the microscopic interactions between electrons and the effective parameters that control the macroscopic behavior of solids.

Current areas of focus:

Theory of quantum liquid crystalline phases of highly correlated electronic fluids
Inter-twined orders and the theory of high temperature superconductivity
Theory of spin liquids and other fractionalized quantum phases
Theory of the glass transition in supercooled liquids

Career History

- Ph.D., Harvard, 1979
- Professor, Physics and Astronomy, UCLA
- Professor, Physics, Stanford, 2004-present

Former Students and Post-Docs

- coming soon

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