Harvard University Department of Physics Colloquium

Monday, March 30, 2020
4:30PM ~ via Zoom

Colloquium Virtual Tea
4:00PM ~ via Zoom

Controlling Quantum Materials with Light

Modern condensed matter physics is increasingly focused on materials exhibiting macroscopic quantum-mechanical effects ("quantum materials") and on ways to manipulate their electronic properties. Ultrafast optical excitation, especially when resonant to specific lattice modes, has recently emerged as a powerful mean to induce new functionalities in quantum materials and to control their properties. A most ambitious goal is to selectively drive structural or electronic degrees of freedom to bring about nonequilibrium superconductivity at temperatures far above the thermodynamic critical temperature Tc. In this talk, I will discuss how midinfrared optical excitation led to transient superconductivity above the equilibrium Tc in cuprates and molecular solids. I will then show how time-resolved x-ray scattering methods can provide new insights into the charge, spin and lattice response of these light-driven states of matter.

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