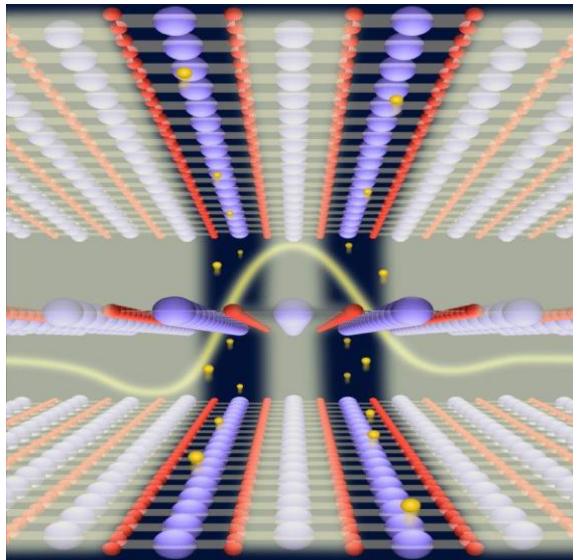


Coherent control of quantum matter

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In this talk I will discuss some of our recent work aimed at controlling the low-lying electrodynamics of quantum solids using strong field transients in the mid-infrared and THz regime. I will cover the excitation of selected vibrational resonances to manipulate the many-body physics of Mott Hubbard Insulators and to perturb competing orders in High-Tc superconductors. Finally, I will show how the electrodynamics of layered superconductors can be driven through the orderparameter phase gradient, demonstrating ultrafast transistor action in a layered superconductor. Technical advances in the use of coherent optics, from tabletop sources to THz and X-ray Free Electron Lasers will also be discussed.