## Max-Planck-Institut für Struktur und Dynamik der Materie



Max Planck Institute for the Structure and Dynamics of Matter

## Tuesday, August 2, 2016 - 11:00 Seminar room III (Blgd. 99)

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Light induced enhancement of superconductivity via melting of competing bond-density wave order in underdoped cuprates

We develop a theory for light-induced superconductivity in underdoped cuprates in which the competing bond-density wave order is suppressed by driving phonons with light. Close to a bond-density wave instability in a system with a small Fermi surface, such as a fractionalized Fermi liquid, we show that the coupling of electrons to phonons is strongly enhanced at the bond-density wave ordering wavevectors, leading to a strong softening of phonons at these wavevectors. For a model of classical phonons with anharmonic couplings, we show that the combination of strong softening and driving can lead to large phonon oscillations. When coupled to a phenomenological model describing the competition between bond-density wave order and superconductivity, these phonon oscillations melt bond-density wave order, thereby enhancing pairing correlations.

A. A. Patel and A. Eberlein, Phys. Rev. B 93, 195139 (2016)



Host: Michael Sentef / Angel Rubio