

PHYSIKALISCHES KOLLOQUIUM

AM 25. JULI 2022 UM 17 UHR C.T.

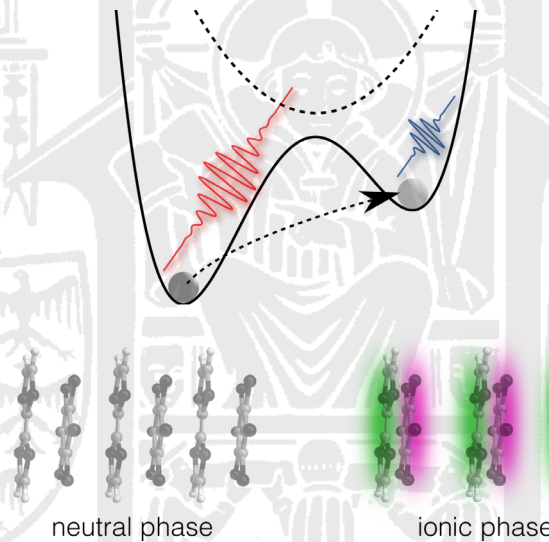
IM GROßEN HÖRSAAL

AKTUELLE INFORMATIONEN FINDEN SIE HIER:

WWW.PHYSIK.UNI-FREIBURG.DE



LIGHT-INDUCED DYNAMICS AND CONTROL OF STRONGLY CORRELATED MATERIALS



JUNICHI OKAMOTO
UNI FREIBURG

Strongly correlated materials with various coupled degrees of freedom exhibit intriguing quantum phases such as Mott insulators or high- T_c superconductivity. However, these equilibrium phases only reflect a fraction of the entire complex energy landscape. The recent development of intense lasers has enabled us to induce and probe their far-from-equilibrium dynamics. This can be utilized to explore the previously hidden regions of the energy landscape and navigate a system into a metastable state. Such optical manipulation is now opening up the field of “nonequilibrium material science”. Following the experimental advances, extensive theoretical investigation is in progress, which is a challenging task because of the many-body nature of the problem. In this talk, I will provide an overview of the topic and discuss two examples where optical excitation leads to genuine nonequilibrium responses in correlated materials: (i) enhanced Josephson tunneling in high- T_c superconductors via parametric driving and (ii) optically induced quantum phase transitions in an organic crystal. In both cases, I will explain how the nonequilibrium states are characterized in simulations and relate the findings to the pump-probe experiments.