**Course of two lectures: Tuesdays March 15 and 22, 4pm**

**Electronic Phase Transitions Induced by Electrical and Optical Impacts.**

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Controlled transformations of electronic states or even of whole phases are achievable today by impacts of very strong electric fields and/or the ultra fast optical pumping. The experimental success is coming from ferroelectrically and ionically enhanced field effect in high-temperature superconductors, induced metallization in oxides of transition metals and in organic materials, field-effect superconductivity in natural and artificial monolayers. The techniques of the femto-second optical pumping span from the purely optical setups to the newer time-resolved photoemission spectroscopy and to the latest time-sliced diffraction. The tested electronic phases include: superconductivity, charge density waves, charge ordering, ferroelectricity, magnetic phases, Peierls and Mott insulators. **A super goal is to attend “hidden” states which are inaccessible and even unknown under equilibrium conditions. Such a bistable switching has been achieved in a “polaronic Wigner-crystalline Mott insulator” 1T-TaS2. Phenomenological theories** allow for modeling of cooperative states and their observed spacio-temporal evolution including collective coherent oscillations, dynamical phase transitions, formation of stable and temporal patterns, stratification with subsequent annihilation of domains.