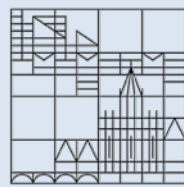


Kolloquium

Theoretische Physik

Universität
Konstanz



Dr. Vladimir M. Stojanovic
University of Basel

Mo 26.11.12
13:30 Uhr
P 603

Polarons: from models to materials to quantum simulation

I will start with a brief introduction on the common electron-phonon coupling mechanisms that may bring about polaronic behavior, focusing on the conditions for the existence of small polarons. In the second part of the talk, an example of a nonanalytic behaviour resulting from Peierls-type (SSH) electron-phonon coupling will be presented, thus breaking the long-held belief that (single-particle) polaron models never show sharp transitions. To illustrate the notion that polaronic carriers are not so commonly found in real materials, the results will be presented of a recent study in which we showed that—contrary to what is often assumed—charge carriers in crystalline organic semiconductors are not polarons. Finally, I will discuss some basic aspects of our recently proposed quantum simulation of small Holstein polaron formation with trapped ions.