

Matériaux thermoélectriques:

de la structure de bandes aux corrélations électroniques

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Durée du module : 2h

Objectifs

The aim of the course is to develop the basic understanding of the influence of the electronic correlations. The consequences of electronic correlations for single-particle spectroscopies and for the thermoelectric properties of the system will be discussed.

Contenu - programme

- 1) Electronic correlations, theory and material examples
 - electronic structure of solids: successes and limitations of the band-picture
 - Mott insulators, Hubbard model
 - correlated metals: renormalized quasiparticle band and atomic excitations
 - temperature evolution of the spectra
 - brief introduction to dynamical mean-field theory
- 2) Seebeck coefficient in a correlated metal
 - calculation of transport, key differences with transport in semiconductors
 - low T Boltzmann transport, influence of velocities and of scattering time
 - high T atomic limit, Heikes formula
 - case of a doped Mott insulator in a dynamical mean-field theory
 - role of entropy, benefits of going to multi-orbital

