The nature of orbital order in transition-metal oxides

Eva Pavarini (FZ Jülich, Germany)

Orbital order plays a crucial role in the physicis of trasition-metal oxides, and yet its nature is poorly understood. Using the LDA+DMFT technique, we disentangle many-body super-exchange from electron-phonon coupling effects. This allows us to finally clarify the role of the Kugel-Khomskii mechanism in determinig orbital order in a number of paradigmatic systems [1,2,3,4].

[1] E. Pavarini, E. Koch, A.I. Lichtenstein, Phys. Rev. Lett. 101, 266405 (2008)

[2] E. Pavarini and E. Koch, Phys. Rev. Lett. 104, 086402 (2010)

[3] A. Flesch, G. Zhang, E. Koch, and E. Pavarini, Phys. Rev. B 85, 035124 (2012)

[4] A. Flesch, E. Gorelov, E. Koch, and E. Pavarini, arXiv1302.5068