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## **Strongly Correlated Superconductivity Near Mott-Jahn-Teller Insulating Phases in Orbitally Degenerate Molecular Conductors**

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I will elaborate on the strongly correlated superconductivity (SCS) scenario [1] which deals with the question whether and under which conditions Cooper-pairing may get enhanced by strong electron repulsion close to the Mott transition in an orbitally degenerate conductor. The core of the SCS proposal is that whereas the effective repulsion between quasiparticles in the charge channel drops close to a Mott metal-insulator transition due to charge freezing, any pairing attraction will remain unrenormalized if it acts inside the spin channel. This scenario was originally demonstrated through a Dynamical Mean Field Theory (DMFT) solution of a model for doped fullerenes [1], but is believed to be more general. Recently, a twofold orbitally degenerate model, with an inverted Hund's rule exchange mimicking Jahn Teller effects, has been proposed as a new candidate for SCS and provides a revealing phase diagram, where superconductivity arises by doping a Mott insulator, out of an unstable pseudogapped metal.[2] A possible experimental realization of this scenario in potassium doped molecular phthalocyanine crystals will be discussed.[3]

(\*) In collaboration with M. Capone, M. Fabrizio, C. Castellani, G.E. Santoro, J. Tobik.

[1] M. Capone, et al, *Science* 296, 2364 (2002), [2] M. Capone et al, *Phys. Rev. Lett.* 93, 047001 (2004). [3] E. Tosatti et al. *Phys. Rev. Lett.* 93, 117002 (2004).