



Contribution ID: 7

Type: not specified

## **SU(2) gauge theory of the pseudogap phase in the two-dimensional Hubbard model**

*Monday, 25 July 2022 14:30 (25 minutes)*

We present a SU(2) gauge theory of fluctuating magnetic order in the two-dimensional Hubbard model. The theory is based on a fractionalization of electrons in fermionic chargons and bosonic spinons. The chargons undergo Néel or spiral magnetic order below a density dependent transition temperature  $T^*$ . Fluctuations of the spin orientation are described by a non-linear sigma model obtained from a gradient expansion of the spinon action. The spin stiffnesses are computed from a renormalization group improved random phase approximation. Our approximations are applicable for a weak or moderate Hubbard interaction. The spinon fluctuations prevent magnetic long-range order of the electrons at any finite temperature. The phase with magnetic chargon order exhibits many features characterizing the pseudogap regime in high- $T_c$  cuprates: a strong reduction of charge carrier density, a spin gap, Fermi arcs, and electronic nematicity.

**Presenter:** BONETTI, Pietro Maria