Csaba Csaki (Cornell)

Thursday, 27 October 2022 11:30 (30 minutes)

[Session Chair: Anton Kapustin (Caltech)]

"Magnetic scattering: pairwise little group and pairwise helicity"

I explain the concept of the pairwise little group which leads to the existence of pairwise helicity for multiparticle states. This pairwise helicity is needed to describe the scattering of magnetically charged particles. I show how to implement pairwise helicity into the spinor-helicity formalism and with its help construct the general 3 point functions. For 2->2 scattering we use the generalization of the partial wave decomposition and derive the famous helicity flip in the lowest partial wave as a simple consequence of a generalized spinhelicity selection rule, as well as the full angular dependence for the higher partial waves. We show a potential resolution of Callan's long-standing semiton problem in our approach. Finally we show how these pairwise states can be understood dynamically as dressed states which incorporate the effects of soft photons, and provide a novel fully field theoretic derivation of Dirac quantization in terms of a geometric Berry phase.