JOINT CCQCN -CCTP SEMINAR

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14:00-15:00

2nd Floor Seminar Room

Holographic baryons and the Sakai-Sugimoto soliton

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Abstract

The Sakai-Sugimoto model is the preeminent example of a string theory description of holographic QCD, in which baryons correspond to topological solitons in the bulk. In the first part of the talk we investigate the validity of various approximations of the Sakai-Sugimoto soliton that are used widely to study the properties of holographic baryons. These different approaches have produced contradictory results in the literature regarding properties of the baryon, such as relations for the electromagnetic form factors. Our analysis clarifies the source of the contradictory results in the literature and resolves some outstanding issues. In the second part we discuss physics at finite baryon density. In holographic QCD models this gets translated into a multi-instanton problem in the bulk, and a state with a high density baryonic charge consists of a non-diluted multi-instanton solution. The instanton bag is a good candidate for this high-density state. We compute its parameters via moduli stabilization. Chiral symmetry restoration is exhibited by this state, and it is a direct consequence of its non-diluted features.