



Contribution ID: 188

Type: **not specified**

## QCD-like theories at finite density

*Thursday, 1 September 2016 15:30 (30 minutes)*

Studies of QCD-like theories without a fermion sign problem at finite density by now have a rather long history already. I will report recent results from two-color QCD, with two instead of the usual three colors, and  $G_2$ -QCD, with gauge group  $G_2$  instead of  $SU(3)$ . Both have bosonic diquark baryons. The physics of those is believed to be fairly well understood and qualitatively resembles QCD at finite isospin density with pion condensation. There is good guidance from effective field theory predictions and model studies of the BEC-BCS crossover inside the condensed phase. This allows to test effective lattice theories such as those for heavy quarks derived for QCD from combined strong-coupling and hopping expansions. We observe good evidence that they are indeed able to resolve the characteristic differences between the various theories. In order to understand the generic features of the density at very low temperatures for light quarks in more detail as well, at reasonable costs, we have also simulated these theories in two dimensions and compared our results with the corresponding free lattice fermions to better disentangle lattice artifacts from baryonic bound states and identify manifestations of confinement at finite density.

### Summary

**Primary author:** Prof. VON SMEKAL, Lorenz (Justus-Liebig University Giessen)

**Presenter:** Prof. VON SMEKAL, Lorenz (Justus-Liebig University Giessen)

**Session Classification:** Section A

**Track Classification:** Section A: Vacuum Structure and Confinement