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QCD-like theories at finite density

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QCD suffers from a sign problem which hampers Lattice Monte Carlo simulations at finite chemical potential. One way to circumvent this problem
in order to gain insights into the phase diagram of strongly interacting matter at finite density is to consider QCD-like theories where this problem is absent.
In this talk we will discuss the phase diagrams of two prototypical examples, 2-color QCD [1,2] and QCD with isospin chemical potential [3], along
with their implications for the phase diagram of 3-color QCD at finite density and relations to other strongly interacting systems such
as ultracold Fermi gases with a population imbalance.

[1] Phys.Rev. D85 (2012) 074007
[2] arXiv:1306.2897 [hep-ph]
[3] Phys.Lett. B718 (2013) 1044-1053

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