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Chiral Symmetry Breaking for Bosonic Partition Functions.

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The behavior of quenched Dirac spectra of two-dimensional lattice QCD is consistent with spontaneous chiral symmetry breaking which is forbidden according to the Coleman-Mermin-Wagner theorem. One possible resolution of this paradox is that because of the bosonic determinant that enters in the partially quenched partition function the conditions of this theorem are violated allowing for spontaneous symmetry breaking in two dimensions or less. This goes back to work by Niedermaier and Seiler on nonamenable symmetries of the hyperbolic spin chain and work with Splittorf on bosonic partition functions at nonzero chemical potential.

In this talk we discuss chiral symmetry breaking for a bosonic random matrix theory at imaginary chemical potential for which the chiral symmetry group is noncompact and compare with results from the corresponding fermionic theory with the usual compact symmetries.

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