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A 3d effective lattice theory for Yang-Mills and QCD thermodynamics

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QCD thermodynamics is crucial for the physics
of the early universe, heavy ion collisions and compact stars.
However, predictions by lattice simulations are very costly
or, in the case of finite baryon density, even impossible because
of a sign problem.
Starting from Yang-Mills theory, it is shown how to use strong
coupling methods to construct a 3d effective theory which
accurately reproduces the deconfinement phase transition.
The generalisation to QCD, which is valid for heavy quarks, has
only a mild sign problem in the case of finite density and
can be simulated efficiently.

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