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## Applications of Jarzynski's relation in lattice gauge theories

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Jarzynski's equality is a well-known result in statistical mechanics, relating free-energy differences between equilibrium ensembles with fluctuations in the work performed during non-equilibrium transformations from one ensemble to the other.

In this talk, an extension of this relation to lattice gauge theory will be presented, along with numerical results for the  $Z_2$  gauge model in three dimensions and for the equation of state in  $SU(2)$  Yang-Mills theory in four dimensions. Then, further applications will be discussed, in particular for the Schroedinger functional and for the study of QCD in strong magnetic fields.

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