Gauge Theory and Khovanov Homology

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After reviewing ordinary finite-dimensional Morse theory, I will explain how Morse generalized Morse theory to loop spaces, and how Floer generalized it to gauge theory on a three-manifold. Then I will describe an analog of Floer cohomology with the gauge group taken to be a complex Lie group (rather than a compact group as assumed by Floer), and how this is expected to be related to the Jones polynomial of knots and Khovanov homology.

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