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**TITLE: Topological Quantum Computing and the Jones Polynomial**

**ABSTRACT:**

**The talk begins with a description of the Aharonov-Jones-Landau (AJL) quantum algorithm which, for given epsilon, computes in polytime epsilon-approximations of the values of the Jones polynomial at roots of unity, with exponentially small probability of failure. We then show how this algorithm can be naturally extended into a polytime quantum algorithm that exactly computes the Jones polynomial (a classical P# problem), also with exponentially small probability of failure. Finally, we show that this transformed quantum algorithm is numerically unstable. This suggests that the AJL quantum algorithm cannot compute the Jones polynomial on a physical quantum computer in polytime.**

**A copy of this PowerPoint presentation can be found at the URL: <http://www.csee.umbc.edu/~lomonaco/Lectures.html>**