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Louis H. Kauffman* (kauffman@uic.edu), Math UIC, 851 South Morgan Street, Chicago, IL 60607-7045. *Unitary Representations of the Artin Braid Group and Quantum Computing.*

This talk will discuss constructions of unitary representations of the braid group using solutions to the Yang-Baxter equation and using recoupling theory based on the bracket model of the Jones polynomial. We shall discuss the relationships of these representations to the construction of quantum gates and quantum algorithms. In particular we give quantum algorithms for computing the colored Jones polynomials and the Witten-Reshetikhin-Turaev invariants. (Received August 08, 2007)