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Derek K Wise* (wise@csp.edu), Dept of Mathematics and Computer Science, Concordia University, 1282 Concordia Avenue, St Paul, MN 55014. *Hopf Algebra Gauge Theory on Ribbon Graphs: A Foundation for Kitaev Lattice Models.*

The Kitaev models in quantum computation are built on ingredients suspiciously reminiscent of lattice gauge theory, but where the gauge group is generalized to a Hopf algebra. However, until recently, this was only an imprecise analogy, since no general notion of Hopf algebra gauge theory was available. I will explain our recent construction, with Catherine Meusburger, of Hopf algebra gauge theory on a ribbon graph, and how this theory provides a mathematical foundation for Kitaev models. In particular, while our main goal was a natural framework for Kitaev models, by generalizing gauge theory from groups to Hopf algebras we also recover quantum Chern-Simons theory, thus framing the Kitaev models within a larger body of work. (Received September 26, 2017)