Tutte Polynomials and Graph Compression
(or, What Probably Should Have Been My PhD Thesis)

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Abstract: In this talk we describe a graph operation called the compression of a graph that has been shown to "weaken" the graph. For instance, Satyanarayana, Schoppmann, and Suffel showed that compressing a graph would result in the new graph having fewer spanning trees and a smaller reliability than the original. (That's our Dr. Laura Schoppmann, BTW) The number of spanning trees and the reliability of a graph are both quantities that correspond to evaluations of a particular graph polynomial called the Tutte polynomial, which has quite a number of other cool and remarkable properties. In this talk we'll introduce the Tutte polynomial and describe how compression affects it. As a consequence we get "for free" the results on spanning trees and reliability, as well as a number of other interesting results involving the various graph properties that the Tutte polynomial captures.