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**David Futer**, **Efstratia Kalfagianni** and **Jessica S Purcell\*** (jpurcell@math.byu.edu),  
Mathematics Department, Brigham Young University, Provo, UT 84602. *Adequate knots, guts, and  
volumes I: surfaces and polyhedra.*

In these talks (parts I and II) we describe recent progress on a project to relate the Jones polynomial of a knot to geometric invariants of the knot complement. More specifically, we explore relations between the Jones polynomial, the hyperbolic volume of the knot complement, and the topology of certain surfaces spanned by the knot (state surfaces). In part I, we describe how a diagram of a knot (which is “adequate” but not necessarily alternating) guides a natural decomposition of the knot complement into polyhedra with some nice properties. One pleasant property is that a certain incompressible surface with the knot as boundary shows up among the walls of the polyhedra. (Received September 22, 2009)