1058-53-127 **Robert B. Kusner*** (kusner@math.umass.edu,robkusner@gmail.com), GANG: Geometry, Analysis, Numerics & Graphics, Department of Mathematics, University of Massachusetts, Amherst, MA 01003. *Knots and Links as Collections of Annuli with Minimal Modulus.*

Any knot or link K in $\mathbf{R}^3$ can be represented as a collection of disjoint embedded annuli which immerse into the unit sphere S^2: a"thick" spherical diagram of K. Now regard S^2 as the Riemann sphere $\mathbf{C} \cup \infty$. The Riemann mapping theorem implies that any annulus in S^2 is conformal to either the punctured plane $\mathbf{C}^* = \mathbf{C} \setminus \{0\}$ or to $A_m = \{z \in \mathbf{C} : m < |z| < 1\}$. Call $m \in [0, 1)$ the *modulus* of this annulus A_m. The unknot is represented by (an annulus conformal to) A_0 (as well as by $\mathbf{C}^*$). Every other K (without trivial components) has a minimal modulus representation by annuli with $m > 0$. We report on some preliminary computations of minimal modulus knots and links (if K has more than one component, minimize the the sum of moduli for each of the representative annuli). Some of these computations exploit the classical representation of higher genus Riemann surfaces as branched covers over the Riemann sphere, making use of (disjoint collections of) embedded annuli with minimal (total) modulus on these Riemann surfaces, and leading to some (interesting?!) connections with Teichmüller theory. (Received February 10, 2010)