962-57-59 **Kenneth C Millett** (millett@math.ucsb.edu), Department of Mathematics, University of CaliforniaSanta Barbara, Santa Barbara, CA 93106, and **Eric J Rawdon*** (rawdon@chatham.edu), Department of Mathematics and Computing, Chatham College, Woodland Road, Pittsburgh, PA 15232. *Spatial Characteristics of Optimal Polygonal Knots.* Preliminary report.

Knot energies measure the complexity of a curve in space. Two examples are the ropelength energy and the Möbius energy. The "thickness" of a smooth knot is the ratio of the maximum radius of a non self-intersecting tube along the knot to its length; the ropelength energy is the reciprocal of the thickness, that is the length of unit-radius "rope" needed to make the knot. The Möbius energy, a variation on the idea of electrostatic self-repelling, is

$$\int_{x\in K}\int_{y\in K}\frac{1}{|x-y|^2}-\frac{1}{\mathrm{arc}(x,y)^2}$$

where $\mathrm{arc}(x,y)$ is the minimum arc distance between x and y. Polygonal versions of these energies have been defined and computer simulation used to find optimal representations of knots with respect to these energies. In this talk, we demonstrate relationships between several spatial quantities measured on the optima for 8, 16, and 32 edge equilateral knots. In particular, we analyze the dimensions of a smallest box containing the knot, the "shape" of the convex hull, the average crossing number, writhe, and total curvature of the optimal conformations and the volume of polygonal knot space consumed by the knot (measured as a probability). (Received August 17, 2000)