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knot energies are minimized by circles.* Preliminary report.

Imagine a curve with an electric charge distributed uniformly along its length, and tied into knot type  $K$ , floating in space. The curve will repel itself, and settle into some least energy conformation. The potential energy of this configuration is known as the *energy* of the knot type  $K$ . Many variants of this idea have been proposed, from the Mobius-invariant energy of Freedman, He, and Wang, to the family of energy functionals of O'Hara, and the energies of Buck and Simon. For the Mobius energy, it has been long known that the curve of least total energy is the round circle. However, the shape of the overall minimizer has been a mystery for almost every other energy functional. In this talk, we discuss some new estimates which show that for a broad class of knot energies (including all of O'Hara's energies), the overall minimizer is the round circle. (Received January 23, 2001)