1058-53-259 **Jason Cantarella*** (cantarella@math.uga.edu), University of Georgia, Mathematics Department, Athens, GA 30602, and **Ted Ashton**, **Michael Piatek** and **Eric Rawdon**. *Lessons from the* ***ridgerunner*** *collection of tight knots.*

Suppose we tie a knot in a rope of fixed circular cross section and pull the knot tight. The resulting shape is the result of a complex interaction between the geometry and topology of the knot. What information can we extract from these shapes?

Over the past several years, we have developed a numerical simulation of the knot-tightening process, based on the method of constrained gradient descent. The result code, called `ridgerunner`, is a very effective knot tightener. This spring, we released the first large-scale publicly available collection of coordinates for tight knots, covering all knots with ≤ 10 crossings and all links with ≤ 9 crossings. This talk presents a short "guided tour" of this dataset, revealing some interesting features of tight knots.

Among other discoveries, we present some explicit examples of local minima for tight knots, discuss the role of curvature constraints in tight knots (tight knots and links seem to almost always be "kinked"), and consider various conjectures about the writhe of tight knot shapes. The talk will include a brief movie of the tightening process. (Received February 16, 2010)