1145-53-1779 **Tom Needham*** (needham.71@osu.edu). *Knot types of generalized Kirchhoff rods.*

Kirchhoff energy is a classical functional on the space of arclength-parameterized framed curves whose critical points approximate configurations of springy elastic rods. We introduce a generalized functional on the space of framed curves of arbitrary parameterization modeling rods with axial stretch or cross-sectional inflation. The periodic critical points of this generalized functional have interesting topological features. For example, the critical sets contain one-parameter families of framed torus knots, mirroring a result of Ivey and Singer for classical Kirchhoff energy. In contrast to the classical theory, the generalized functional has knotted critical points which are not torus knots. We will describe connections with fluid dynamics via the symplectic geometry of framed loop space. (Received September 24, 2018)