Analysis of O'Hara's knot energies

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All of us know how hard it can be to decide whether the cable spaghetti lying in front of us is really knotted or whether the knot vanishes into thin air after pushing and pulling at the right strings.

In this talk we approach this problem using gradient flows of a family of energies introduced by O'Hara in 1991-1994. We will see that this allows us to transform any closed curve into a special set of representatives - the stationary points of these energies - without changing the type of knot. We prove longtime existence and smooth convergence to stationary points for these evolution equations.