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**Maximilian K Rezek\***, 2700 Reynolda Road, Apt. 503, Winston-Salem, NC 27106, and **John Gemmer**. *Isometric Immersions, Energy Minimization, Periodic Patterns, and the Geometry of Leaves*. Preliminary report.

In the non-Euclidean model of elasticity, growth is modeled by a Riemannian metric that encodes local changes in distance. In response to the growth, the sheet deforms to minimize an elastic energy. The elastic energy consists of the sum of the stretching and bending energy. Minimizers of the stretching energy consist of isometric immersions of the metric, while minimizers of the bending energy remain flat. The competition between bending and stretching selects a pattern in the sheet. In this talk, we will show that periodic patterns have the lowest energy for a large class of metrics. Qualitatively, our results agree with patterns observed in leaves and torn elastic sheets. (Received August 29, 2018)