## 1057-35-212 Marta Lewicka and Reza Pakzad\* (pakzad@pitt.edu), Department of Mathematics, University of Pitt, 301 Thackeray Hall, Pittsburgh, PA 15260. Growing tissues, non-Euclidean elasticity and thin film models.

Certain elastic bodies, e.g. some growing tissues, exhibit non-zero stress at their free equilibria. In particular, they do not seem to attain their ideal configuration due to some internal constraints. We will first discuss this phenomenon from a differential geometric point of view: the growth changes the intrinsic metric of the tissue to a new target non-flat metric. The non-vanishing curvature is the cause of the residual stress at equilibria. We further discuss the scaling laws and the thin film limits of the introduced 3d functional on thin plates in the limit of vanishing thickness. Relationships with Sobolev isometric immersions and some related geometric inequalities will be discussed in this context. (Received January 22, 2010)