

Abstract Submitted
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Shape Selection in Chiral Ribbons - From Seed Pods to Supramolecular Assemblies HILLEL AHARONI, SHAHAF ARMON, ERAN SHARON, The Hebrew University of Jerusalem — We provide a geometric-mechanical model for calculating equilibrium configurations of chemical systems that self-assemble into chiral ribbon structures. The model is based on incompatible elasticity and uses dimensionless parameters to determine the equilibrium configurations. As such, it provides universal curves for the shape and energy of self-assembled ribbons. We provide quantitative predictions for the twist-to-helical transition, which was observed experimentally in many systems. In addition, we predict bi-stability of wide ribbons and also show how geometrical frustration can cause arrest of ribbon widening. Finally, we show that the model's predictions provide explanations for experimental observations in different chemical systems.

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