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### **Wrinkles, loops, and topological defects in twisted ribbons**

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Nature abounds with elastic ribbon like shapes including double-stranded semiflexible polymers, graphene and metal oxide nanoribbons which are examples of elongated elastic structures with a strongly anisotropic cross-section. Due to this specific geometry, it is far from trivial to anticipate if a ribbon should be considered as a flat flexible filament or a narrow thin plate. We thus perform an experiment in which a thin elastic ribbon is loaded using a twisting and traction device coupled with a micro X-ray computed tomography machine allowing a full 3D shape reconstruction. A wealth of morphological behaviors can be observed including wrinkled helicoids, curled and looped configurations, and faceted ribbons. In this talk, I will show that most morphologies can be understood using a far-from-threshold approach and simple scaling arguments. Further, we find that the various shapes can be organized in a phase diagram using the twist, the tension, and the geometry of the ribbon as control parameters. Finally, I will discuss the spontaneous formation of topological defects with negatively-signed Gaussian charge at large twist and small but finite stretch.