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Crystals that rotate as they shrink

Motion by mean curvature is used to mathematically model the motion of grain boundaries in annealing materials. But in molecular dynamics simulations, crystals are observed to rotate as they shrink, and moreover to rotate the "wrong" way, towards a higher surface energy per unit length. A variationally-derived model for moving curves and surfaces is produced which incorporates three novel ingredients and which produces not only this "wrong" rotation but also predicts situations in which crystals might actually grow as they rotate through some angles.