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The Relationship between Self-Assembly and Conformal Mappings CARLOS DUQUE, CHRISTIAN SANTANGELO, University of Massachusetts Amherst — The isotropic growth of a thin sheet has been used as a way to generate programmed shapes through controlled buckling. We discuss how conformal mappings, which are transformations that locally preserve angles, provide a way to quantify the area growth needed to produce a particular shape. A discrete version of the conformal map can be constructed from circle packings, which are maps between packings of circles whose contact network is preserved. This provides a link to the self-assembly of particles on curved surfaces. We performed simulations of attractive particles on a curved surface using molecular dynamics. The resulting particle configurations were used to generate the corresponding discrete conformal map, allowing us to quantify the degree of area distortion required to produce a particular shape by finding particle configurations that minimize the area distortion.

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