

Abstract Submitted
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Combinatorial Design of Origami Strips PETER DIELEMAN, SCOTT WAITUKAITIS, Leiden University, MARTIN HECKE, Leiden University FOM institute AMOLF — Combinatorial design of origami patterns holds great promise for creating shape-shifting materials. Here we will show that a previously overlooked symmetry in the folding motion of 4-vertices can be exploited to create rigidly foldable origami patterns with unit cells containing an arbitrary number of vertices. Fold patterns with this symmetry can be constructed combinatorially, by adding together 2 by 2 vertex puzzle pieces. We will focus on a subclass of these patterns, which consists out of fold patterns with two folding branches. We will show that these two branches can be programmed such that they fold into the shape of 2 complexly curved, quasi 1D strips. Therefore, fold patterns in this subclass have the ability to shift from one preprogrammed shape, into another.

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