

Abstract Submitted
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Exponential Number of Shapes in Origami Metasheets PETER DIELEMAN, Univ of Leiden / AMOLF, SCOTT WAITUKAITIS, Univ of Leiden, MARTIN VAN HECKE, Univ Leiden / AMOLF — The simplest possible fold pattern that allows for motion, the 4-vertex, has two distinct branches of motion. By deriving a local combinatorial rule, we show that the number of branches in a tessellated sheet of such 4-vertices grows exponentially with the number of vertices. We introduce energy in the system by approximating the folds as torsional springs and show that we can create an arbitrary number of well separated minima, i.e. shapes. With 3D printing, we bring these shape-shifting structures to life.

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