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Light-induced sequential self-folding of pre-strained polymer sheets JAN GENZER, YING LIU, BRANDI SHAW, MICHAEL DICKEY, NC State University — Self-folding is a self-assembly process that causes a predefined 2D template to fold into a desired 3D structure with high fidelity. We have developed a simple method of self-folding that uses predefined ink "hinges" printed onto pre-strained polymer sheets via a desk top printer. The ink absorbs external light, causing the area underneath the hinge to heat up and relax the strain in the hinge regions gradually across the sheet thickness. This process results in folding the sheet at the hinge region. We will demonstrate that sequential folding of multiple hinges on the same sample can be programmed by changing the light source and ink color of the hinge. We have successfully employed this strategy to produce complex origami shapes.

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