Abstract Submitted for the MAR17 Meeting of The American Physical Society

Nanoscale Sheets for Rapid Bidirectional and Sequential Folding¹ BARIS BIRCAN, MARC MISKIN, KYLE DORSEY, ITAI COHEN, PAUL MCEUEN, Cornell University — Using readily available planar fabrication methods, we are developing self-folding devices that consist of patterned quasi-two dimensional sheets. These devices, formed by stacking nanometer thick layers of different materials, controllably bend as a result of differential stress. This stress is generated by ion substitution reactions, which occur on a time scale of about a second in nanoscale sheets. By patterning the sheets laterally, we localize the bending and generate folds with micron scale radii of curvature in the direction of our choice. Finally, we show that this approach offers a wide range of mechanical, chemical, electrical, magnetic and biological functions as well as a path to sequential folding through the individual programming of layers.

¹This research was supported in part by NSF DMR 1435829. This work was performed in part at the Cornell NanoScale Facility.

> Itai Cohen Cornell University

Date submitted: 11 Nov 2016

Electronic form version 1.4