Supporting Information

Bi-axially Mechanical Tuning of 2-D Reversible and Irreversible Surface Topologies through Simultaneous and Sequential Wrinkling

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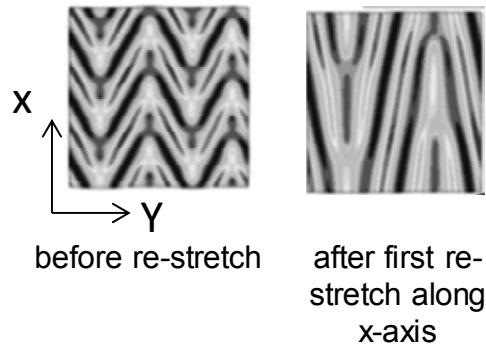before re-stretch   after first re-stretch along x-axis

Figure S1: Simulated pattern evolution after first stretching along the x-axis with a strain of 10% followed by a strain of 25% along y-axis: Left: herringbone pattern before re-stretching; Right: intermediate branched wrinkled pattern after first stretching of 10% along x-axis. After a second re-stretch along y-axis, the wrinkles disappear and herringbone pattern returns to a flat surface
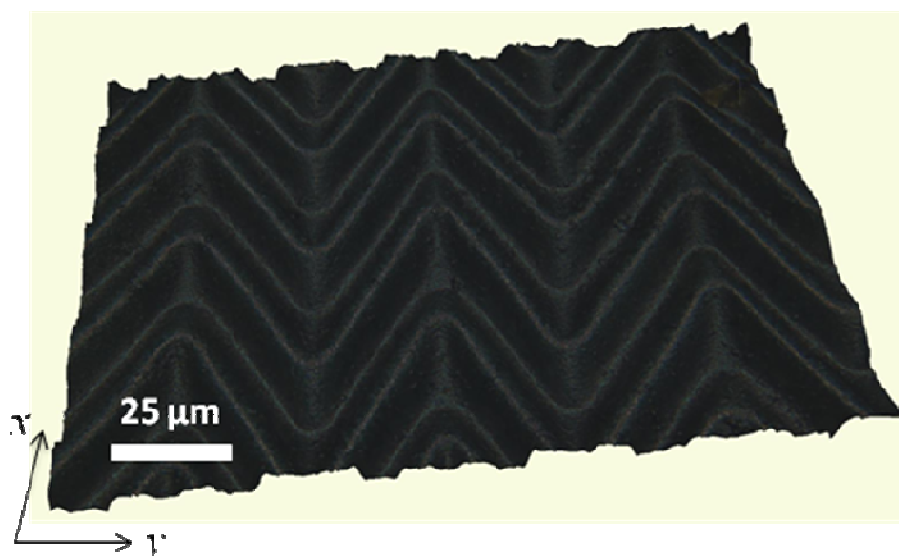
Figure S2 Wrinkling pattern obtained after stretching of 10% along *x*-axis and 25% along *y*-axis and sequential release for a second time
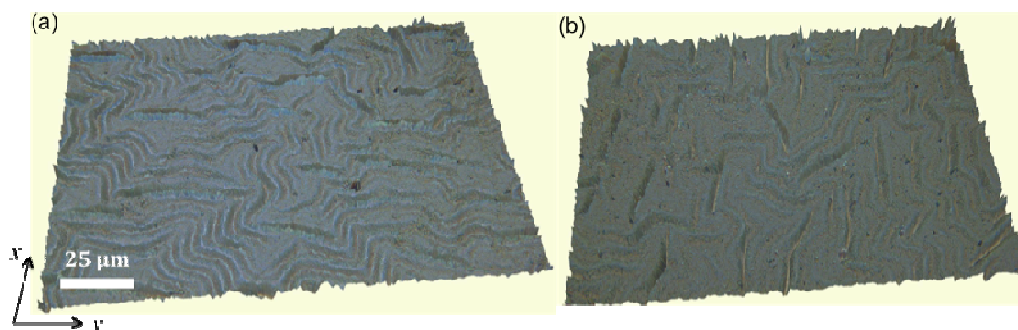

Figure S3 (a) Labyrinth pattern after sequential release of strain in the residual pattern of Figure 5d; (b) Labyrinth pattern after simultaneous release of strain in the residual pattern of Figure 5c.
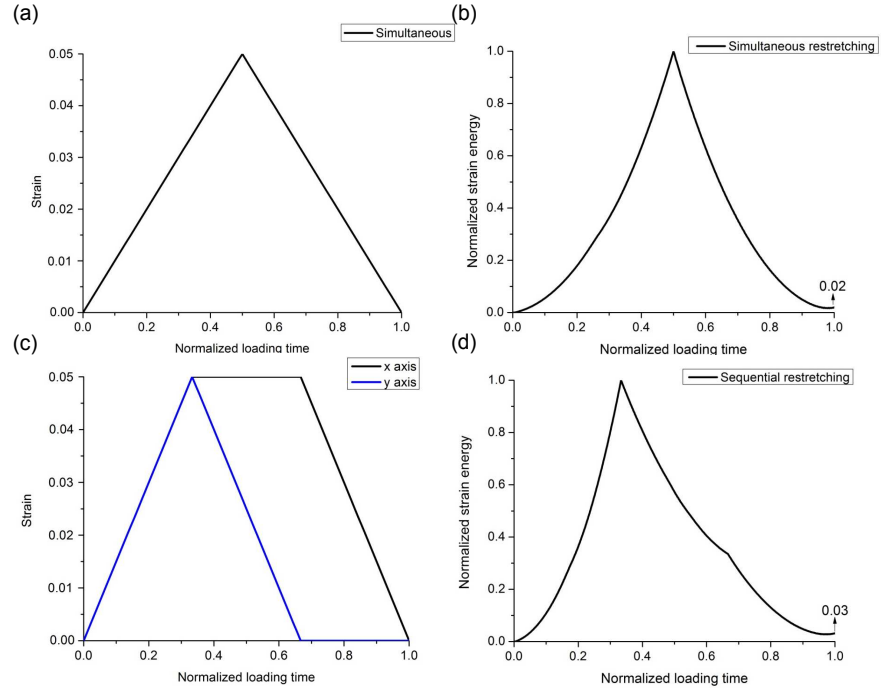
Figure S4: (a) Simultaneous loading and unloading of equi-biaxial strain of 5% with normalized loading time. (b) Corresponding normalized strain energy in the film with loading time, (c) Simultaneous loading and sequential unloading of equi-biaxial strain of 5% along x and y axis; (d) Corresponding normalized strain energy in the film with loading time
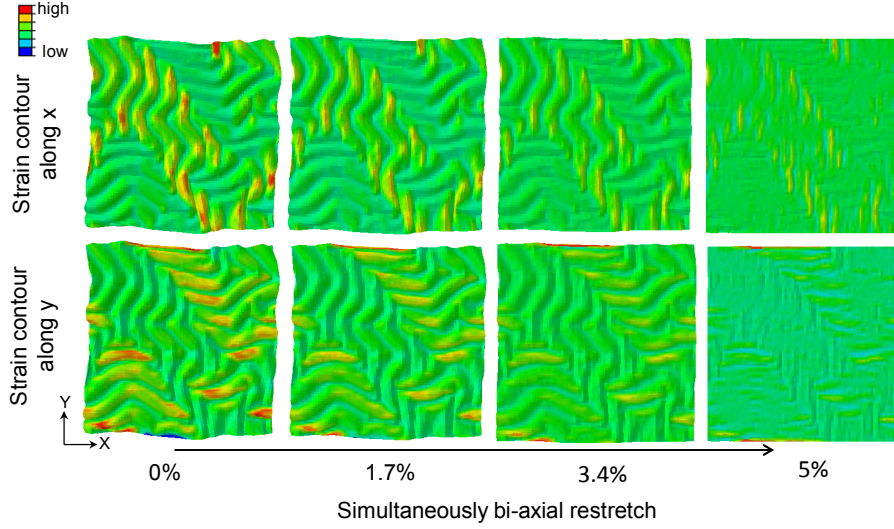
Figure S5 Simulated in-plane normal strain contours of the top layer of PDMS substrate upon simultaneously bi-axial re-stretching of labyrinth patterns to its original strain of 5%; top row: strain contours evolution along *x*-axis with simultaneous re-stretch strain; bottom row: strain contours evolution along *y*-axis with simultaneous re-stretch strain
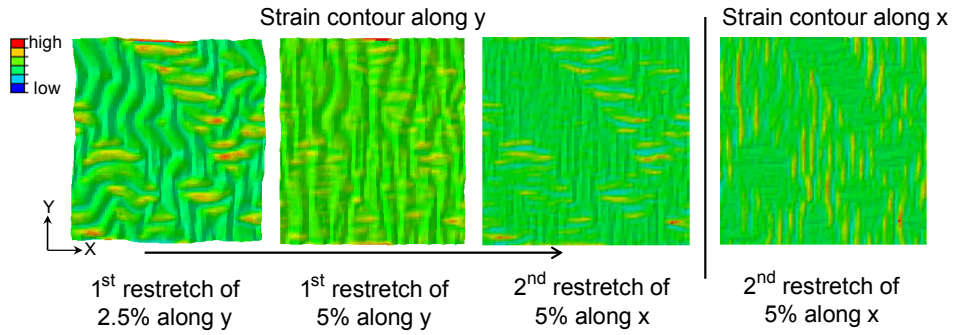

Figure S6 Simulated in-plane normal strain contours of the top layer of PDMS substrate upon sequentially re-stretching of labyrinth patterns to its original strain of 5%; left: strain contours evolution along *y*-axis with simultaneous re-stretch strain; right: strain contour along x-axis after second re-stretch of 5% along *x*