

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Construction of complex 3D configurations - flower-shaped geometry. The blue-violet petals bend dramatically towards the light source while the green petals only generate slight bending.

File Name: Supplementary Movie 2

Description: Biomimetic locomotion - swing of butterfly wings. The wings close rapidly after light on and open gradually after light off.

File Name: Supplementary Movie 3

Description: Patterned bilayers for different motion modes: symmetric folding, outer bending, twisting, and asymmetric folding.

File Name: Supplementary Movie 4

Description: Phototropic bending movement of a photonic sunflower. The artificial sunflower tracks light source continuously with its petals and stamen keep facing the light.

File Name: Supplementary Movie 5

Description: Phototropic twisting movement of an artificial lollipop-like geometry. The lollipop-like geometry tracks the light source continuously with the continuous twisting movement.

File Name: Supplementary Movie 6

Description: Self-tracking photovoltaic system. The solar cells track light source continuously with the continuous bending movement of the photonic bilayer.

File Name: Supplementary Movie 7

Description: A self-folding box. 0° illumination causes the folding of the patterned two sides, while 45° illumination cause the four sides to fold simultaneously into a box-like shape.