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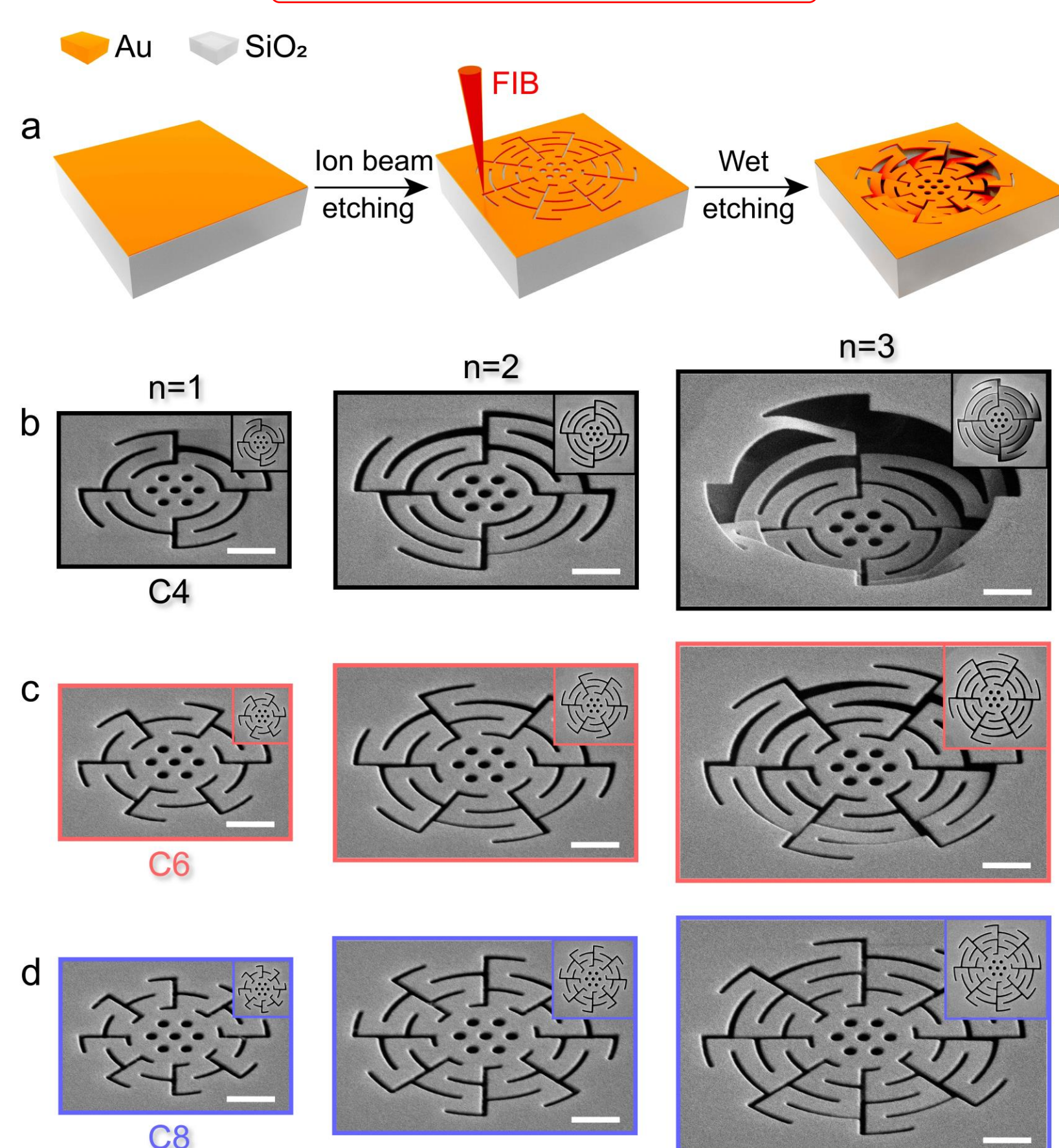
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## Deforming micro/nanostructures

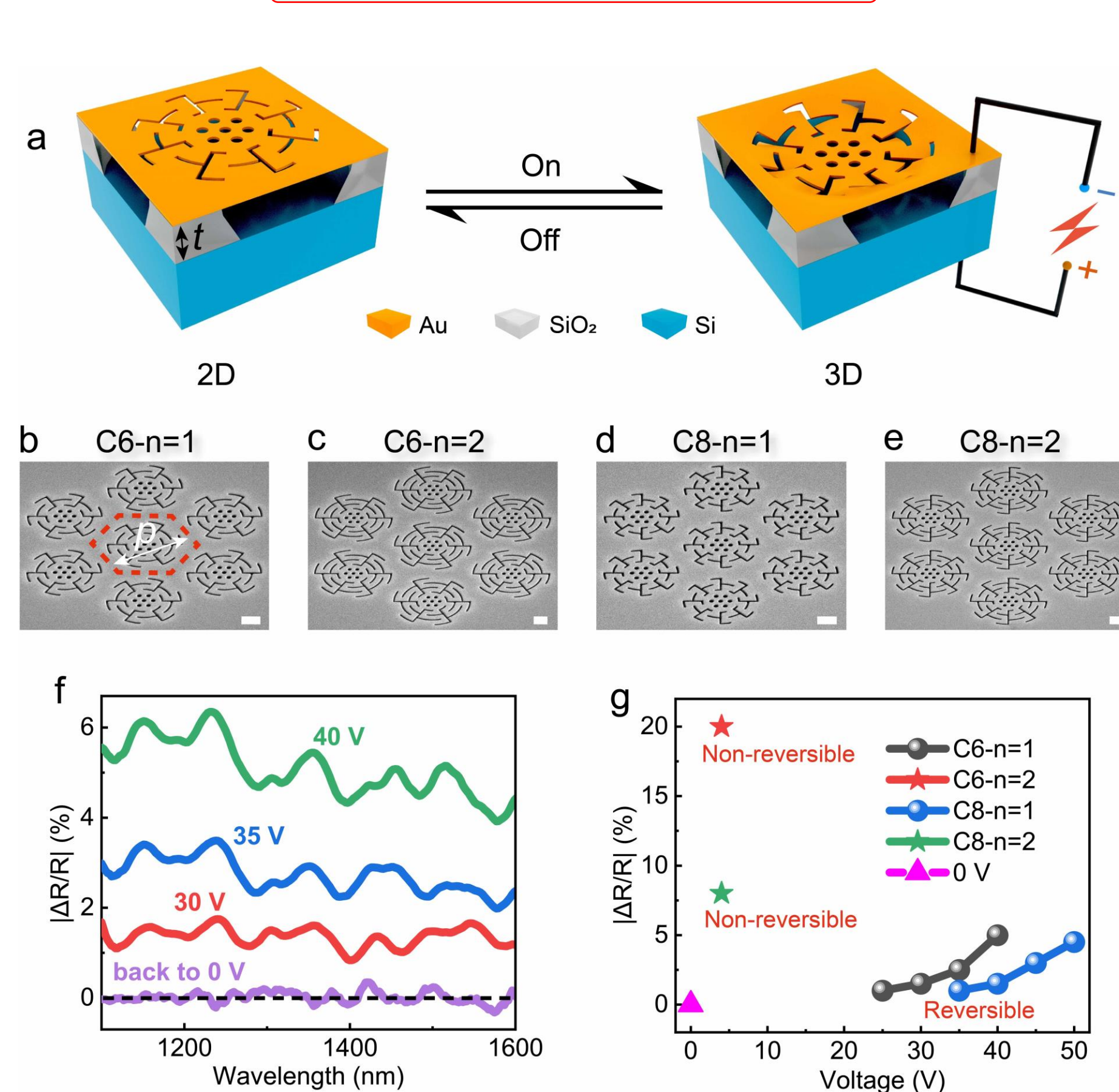
Deformable micro/nano structures have demonstrated remarkable performance and a wide range of potential applications in recent research. Here, we have achieved rich geometric shapes of deformable micro/nano structures through diverse designs, customized fabrications, and multi-field drives. Figures 1-3 show the structures can be transformed by capillary force, electrostatic force, and electro-mechanical-chemical (EMC) coupling mechanism. Moreover, we found that deformable micro/nanostructures can be used to achieve the customized optical vortices, dynamic color displays, and reconfigurable spectra (in Figures 4-6). Compared to the traditional metasurface methods, our strategies are more efficient and practical, this will bring new opportunities to functional 3D micro/nano structures with improved optical tunability and customization. Deformable micro/nano structures might bring more applications based on their the unique characteristics.

### Capillary force



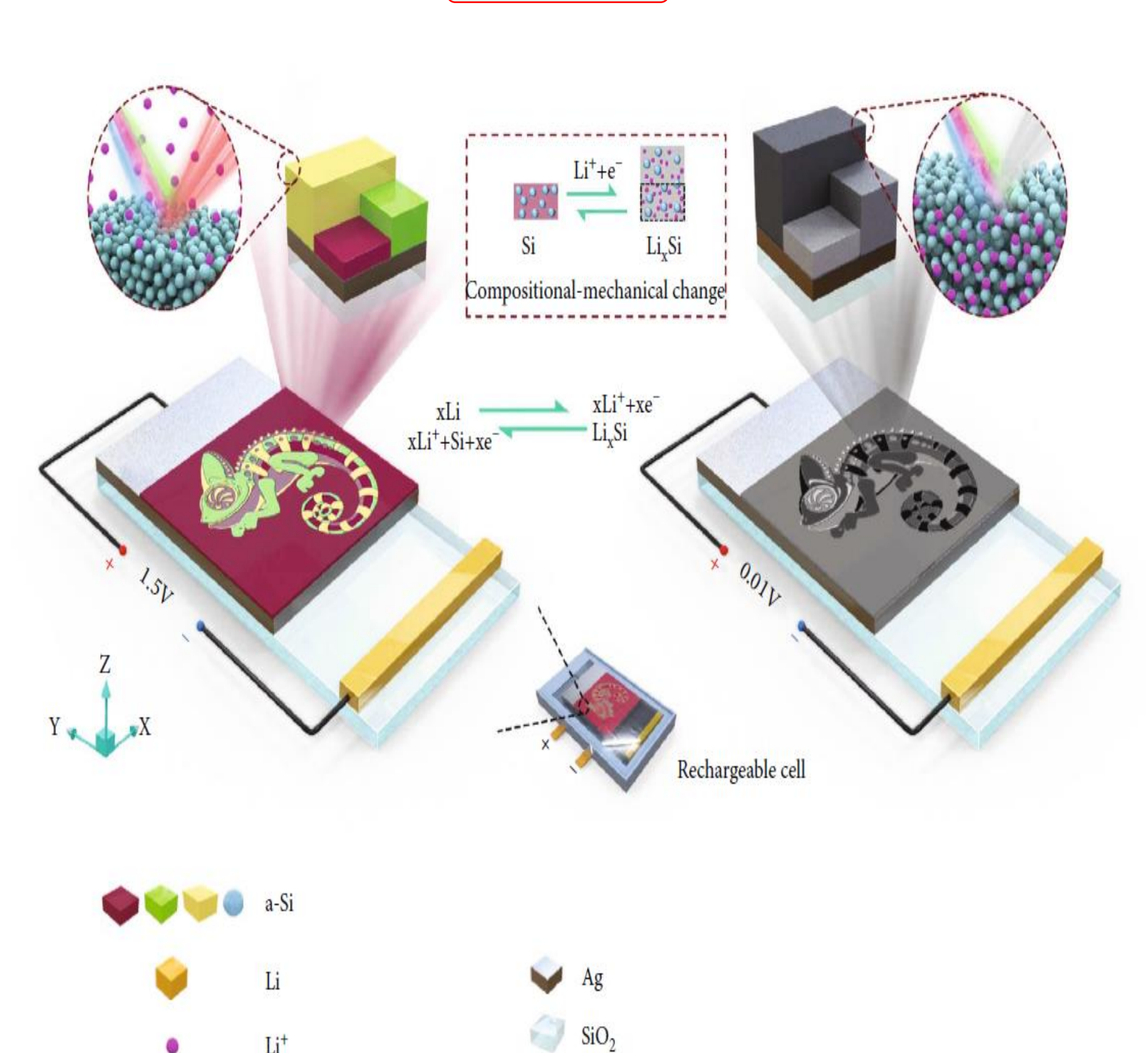
**Figure 1:** Deformable fractal nano-kirigami structures acted by the capillary force.

### Electrostatic force



**Figure 2:** Deformable fractal nano-kirigami structures acted by the electrostatic force.

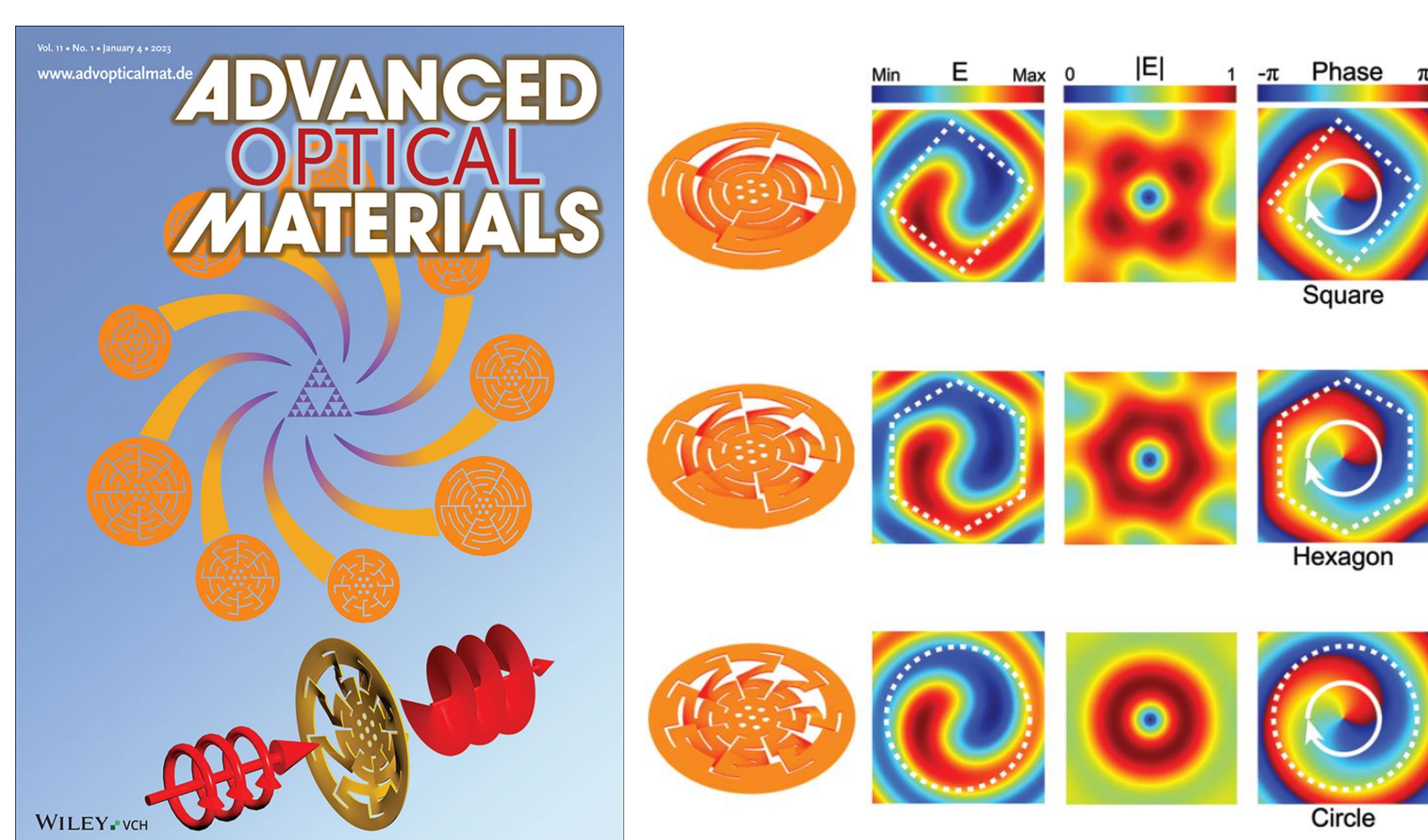
### EMC



**Figure 3:** Deformable metasurface structures with EMC method.

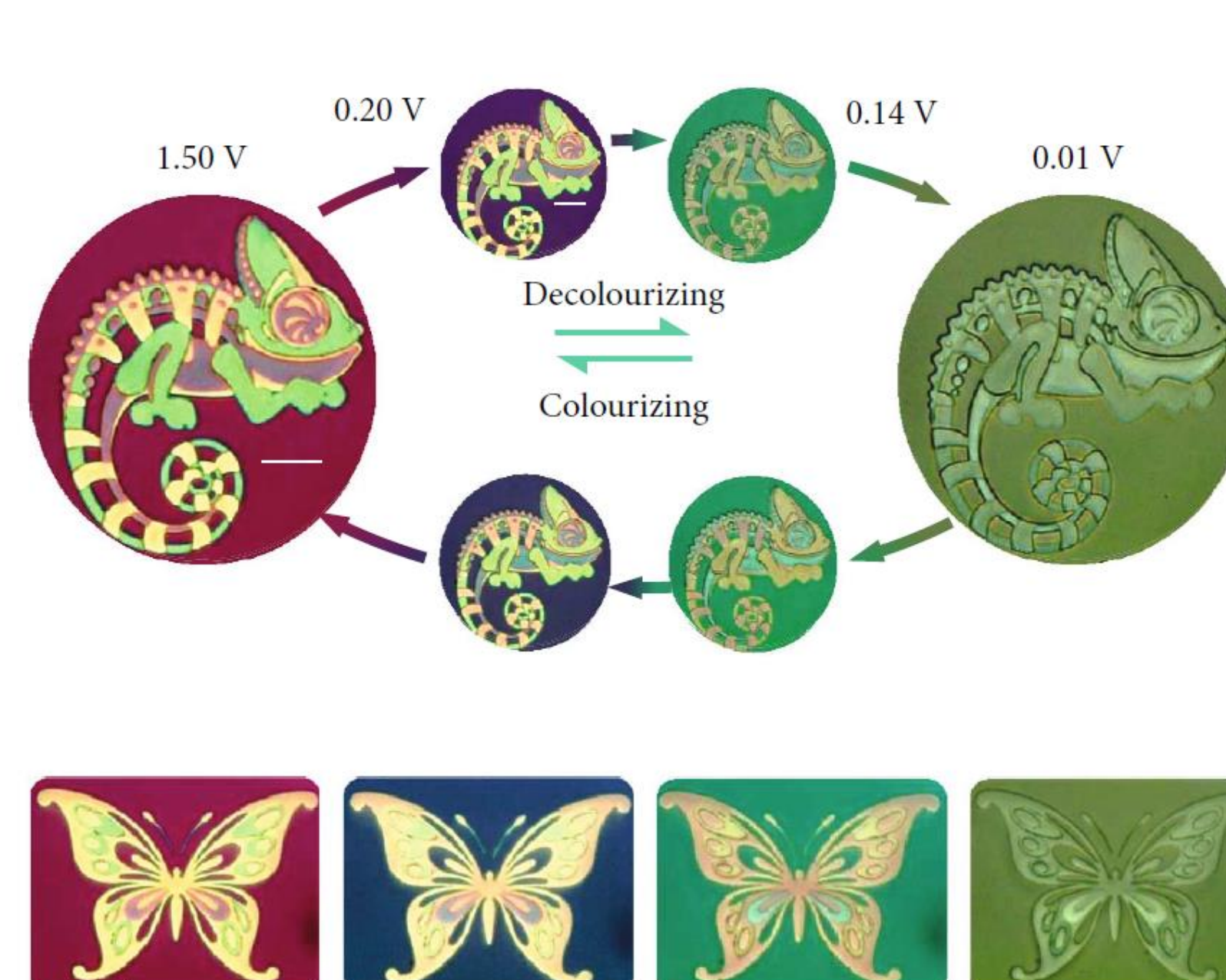
## Photonic modulations by deformable micro/nanostructures

### Customized optical vortices



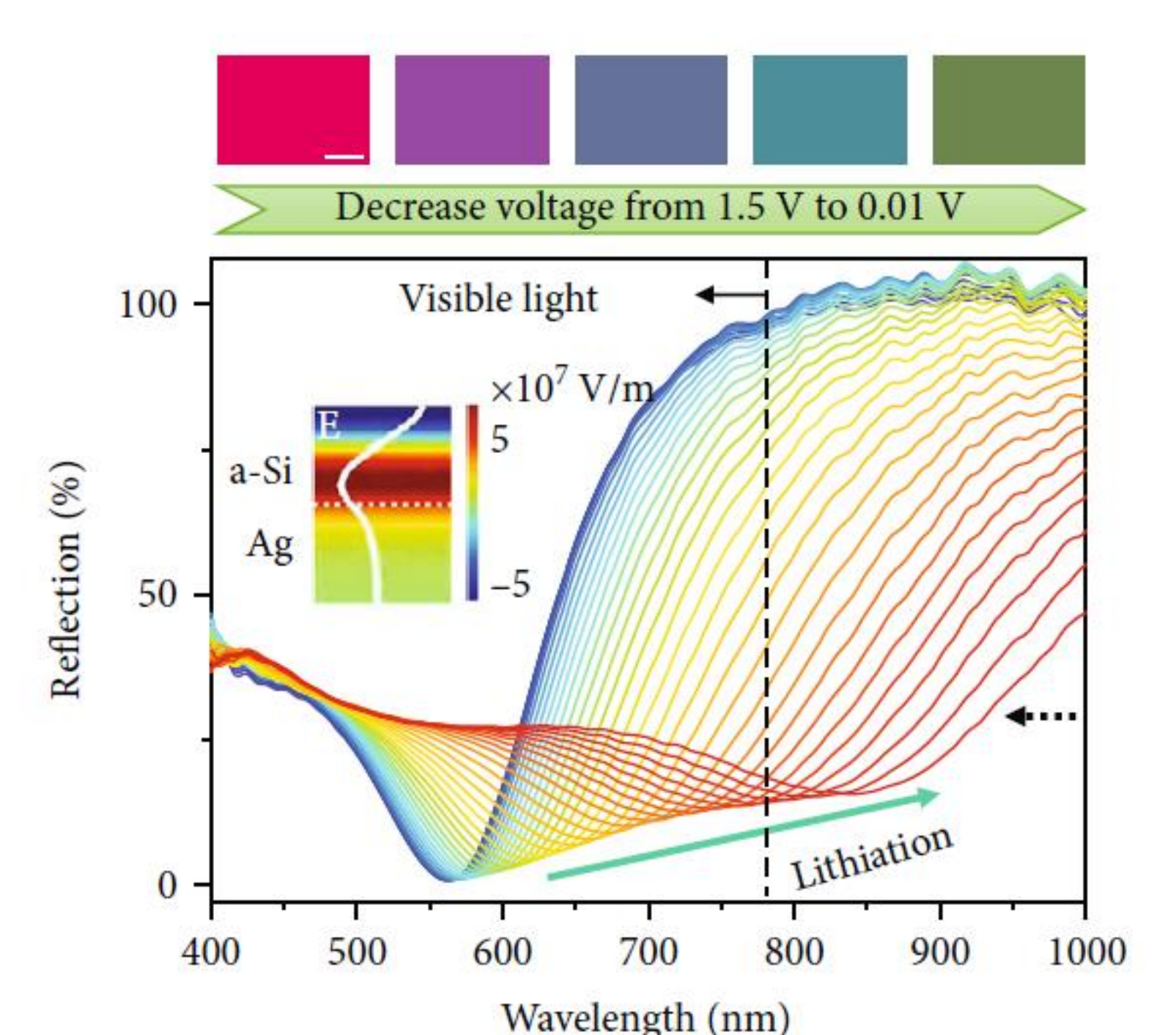
**Figure 4:** Deformable fractal nano-kirigami structures with rotational symmetries are envisioned to provide the capability of conveniently generating optical vortices.

### Dynamic color displays



**Figure 5:** Deformable metasurface structures perform the rich dynamic color displays.

### Reconfigurable spectra



**Figure 6:** Deformable metasurface structures are used to control the light spectra.

## References

1. Xiaorong Hong, et al. *Adv. Optical Mater.*, 11, 2202150 (2023).
2. Le Yang#, Xiaorong Hong#, et al. *Research*, 2022, 9828757 (2022).