

## Electronic Supplementary Information

### **Micro-patterning of 3D colloidal photonic crystals via solvent-assisted imprint lithography**

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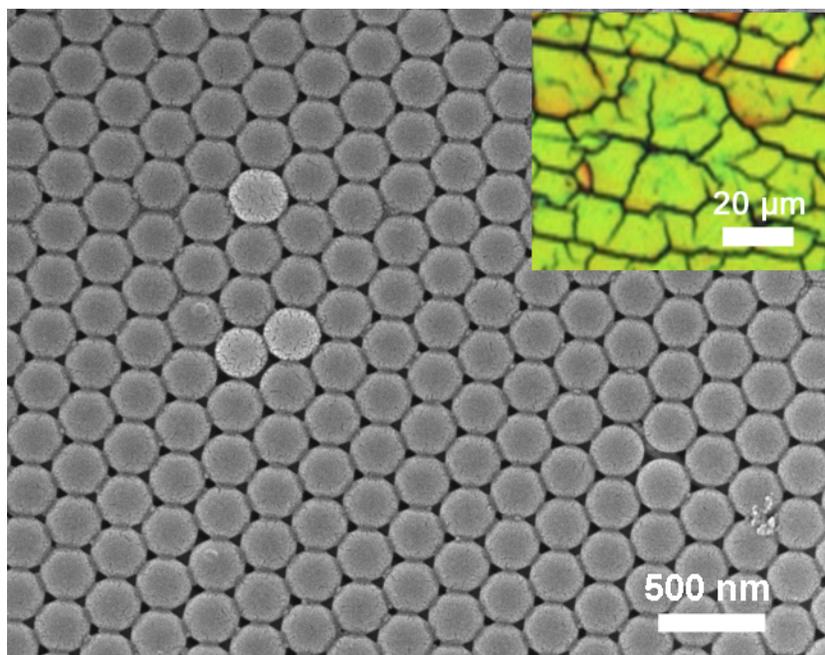


Figure S1. The SEM image of the PS colloidal crystals made of PS spheres with diameter of ~240 nm. The inset is the optical image of the colloidal crystals showing green structure color.

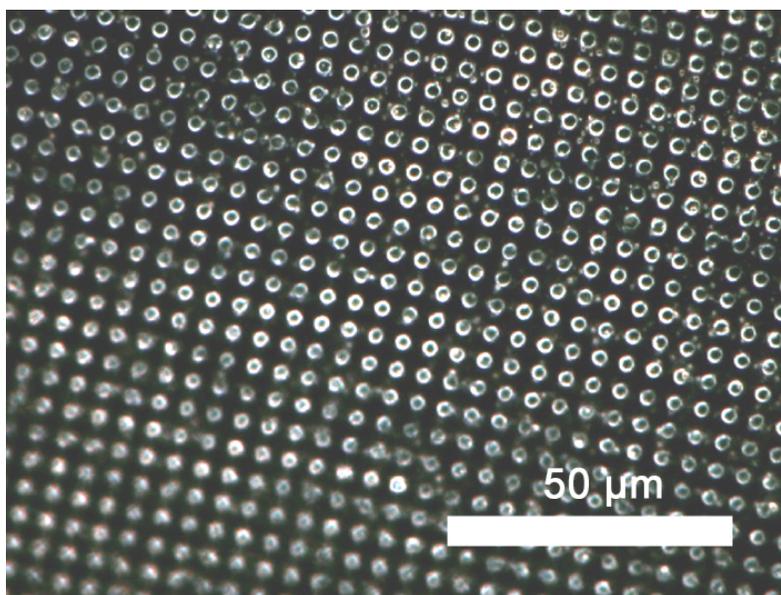


Figure S2. The optical image of micropatterned PS colloidal crystals after being moulded with PDMS stamp (2.5 min solvent evaporation). Since the amount of toluene is excess, the colloidal crystal films were merged into homogeneous film with no structure color.

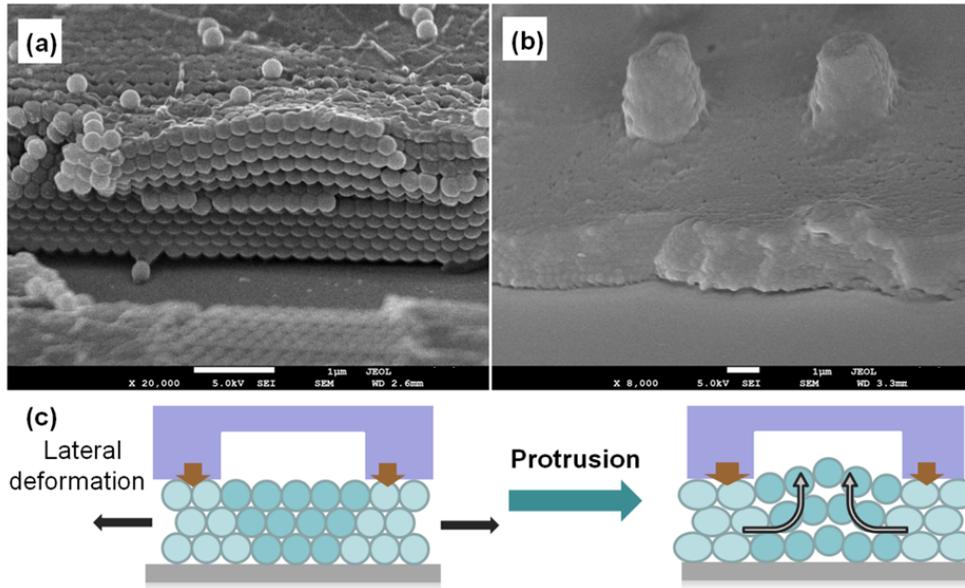


Figure S3. The side views of the micropattern in the molded PS colloidal crystals after (a) 3 min and (b) 2 min solvent evaporation. Scale bars are 1 μm. In the case of (a) 3 min, we can see that the minute amount of toluene only melted and merged the surface layer of PS colloidal particles, while the layers below still maintained the colloidal photonic structures. Interestingly, the patterned regions were extruded into bumps and the distance between the crystalline planes along vertical direction was enlarged. In the case of (b) 2 min, we can observe that the excess amount of toluene had merged the whole colloidal crystals into homogenous film with little refractive index contrast and the colloidal particles in the patterned regions were merged into micropillars with rough surface. (c) is the schematic illustration of the deformation process.

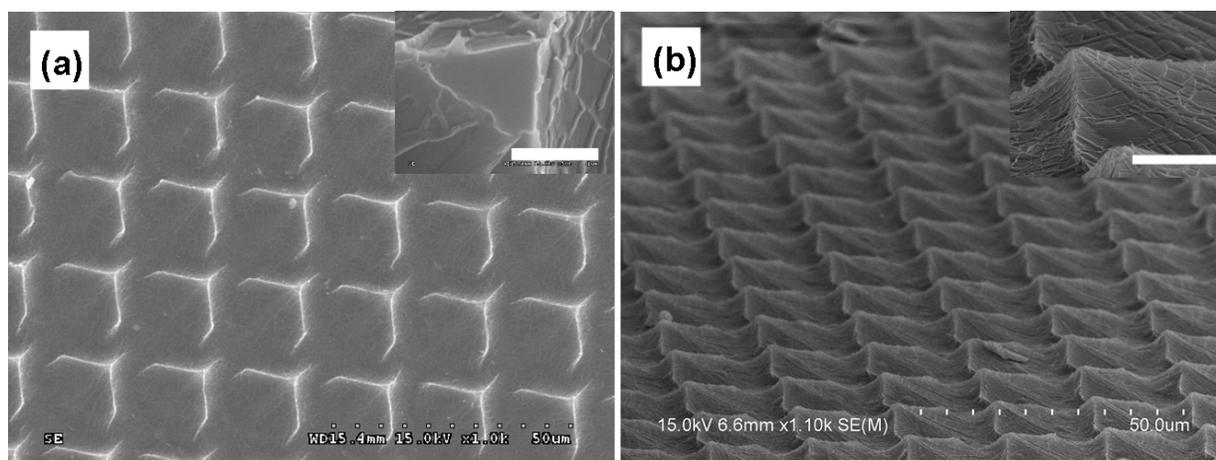


Figure S4. The SEM images of micropatterned PS colloidal crystals after being molded with PDMS stamp ( $20 \times 20 \mu\text{m}^2$ ) after 1 min solvent evaporation. (a) top view, (b) side view, scale bars are  $50 \mu\text{m}$  and the insets are the magnified view with scale bar of  $1 \mu\text{m}$  and  $25 \mu\text{m}$  respectively. Since the toluene was excess in the PDMS matrix, the PS colloidal crystal films were totally merged into homogeneous film and molded to form unconventional micropatterns with replicated topology of the deformed mold.