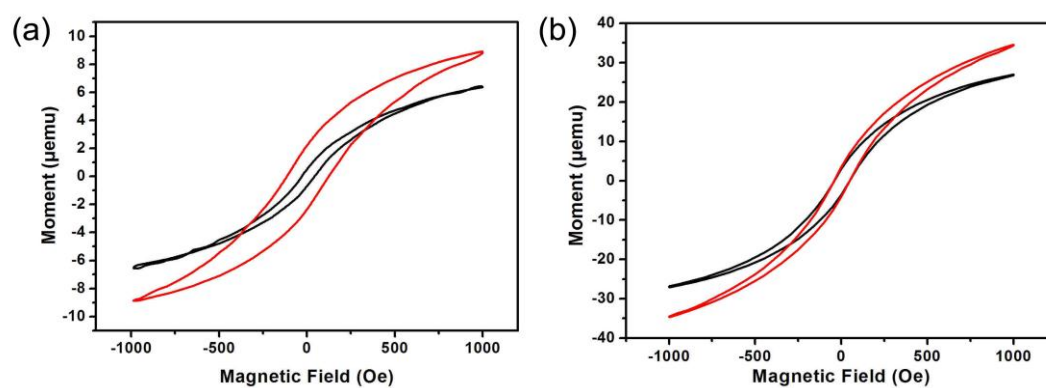
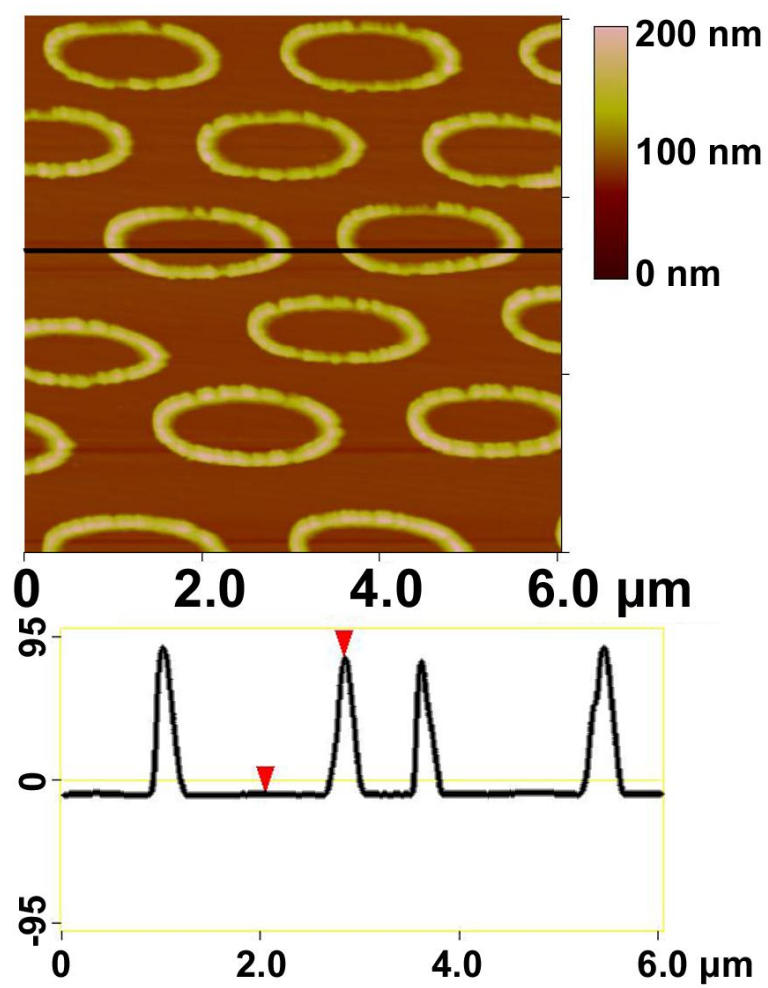


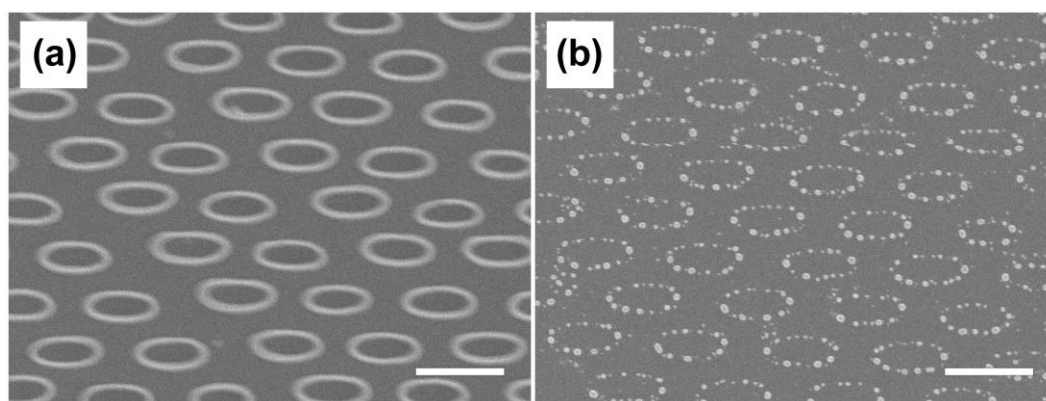
**Fig S1.** SEM image of the as-prepared elliptical ring arrays with low magnification. The scale bar is 10  $\mu\text{m}$ .



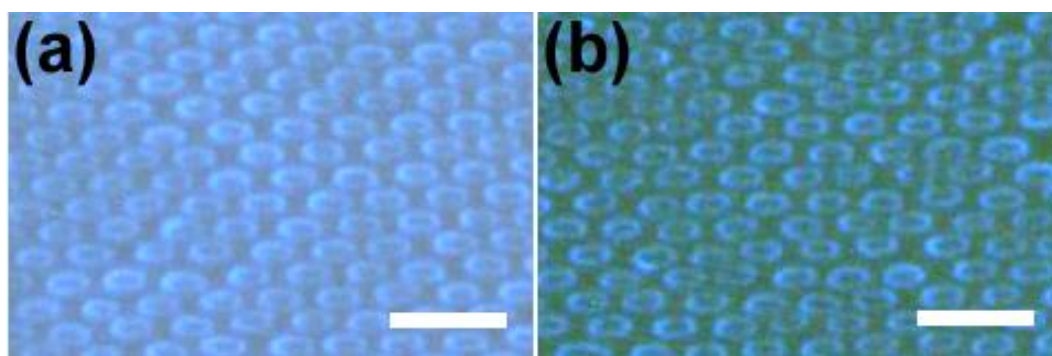
**Fig S2.** Magnetic hysteresis loops measurements of (a) the Fe/Ni ERAs and (b) the  $\text{Fe}_3\text{O}_4$  ERAs measured under two perpendicular applied field directions (parallel to the long axis or the short axis of the ERAs).



**Fig S3.** AFM image and line profile of the Fe(acac)<sub>3</sub>/PS complex ERAs.



**Fig. S4** SEM images of the (a) Si-ERA and (b) Au-ERA after annealing at 500 °C for 2 hours. The scale bar is 2  $\mu\text{m}$ .



**Fig. S5** The fluorescent photo images of the ERAs of PS/CPEY composite (a) before and (b) after annealing at 80 °C for 1 hour. The scale bar is 5  $\mu\text{m}$ .

Elastic modulus Mpa	Max stress Mpa	Bresk strain %
5.26	2.68	7.78

**Table S1.** Elastic modulus, max stress and break strain of the photopolymerizable resin.