## Supplementary information:

## Macroporous oxide structures with short-range order and bright structural coloration: a replication from parrot feather barbs

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**Figure S1.** Optical cross-section images of the fabricated macroporous  $SiO_2$  sample under (a) normal and (b) oblique observation. The blue color does not change with the observing angle. Scale bars: 20  $\mu$ m.



**Figure S2.** Optical cross-section images of the fabricated macroporous  $SiO_2$  sample (a) without and (b) with ethanol infiltrated. The blue color disappears after the infiltration of ethanol. Scale bars: 20  $\mu$ m.



**Figure S3.** (a) Reflected and (b) transmitted optical cross-section images of the fabricated macroporous  $SiO_2$  sample. The colors produced by the macroporous structure under reflected and transmitted modes are complementary. Scale bars: 20  $\mu$ m.



**Figure S4.** (a) Reflected and (b) transmitted optical cross-section images of the fabricated macroporous  $TiO_2$  sample. The colors produced by the macroporous structure under reflected and transmitted modes are complementary. Scale bars: 20  $\mu$ m.



**Figure S5.** The XRD pattern of the fabricated macroporous  $TiO_2$  samples calcined at 550 (black) and 850 °C (red) in air with anatase and rutile phases, respectively.



**Figure S6.** (a) Optical and (b) SEM cross-section images of a fabricated  $TiO_2$  structure calcined at 850 °C. Scale bars: (a) 20  $\mu$ m and (b) 500 nm.