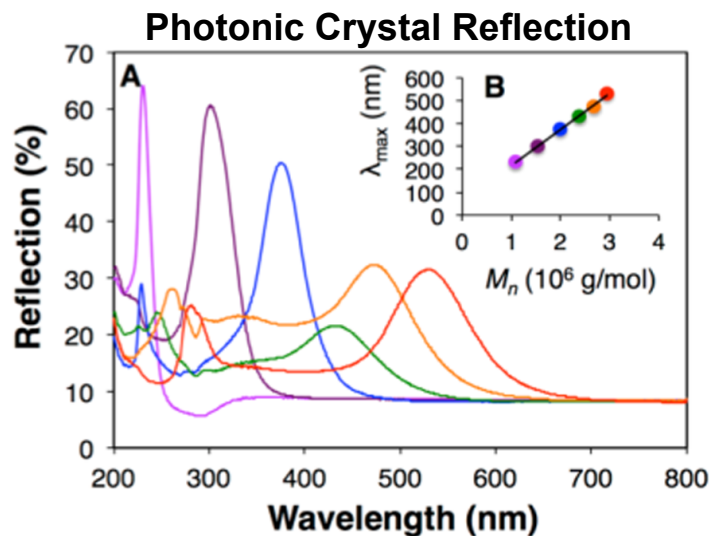
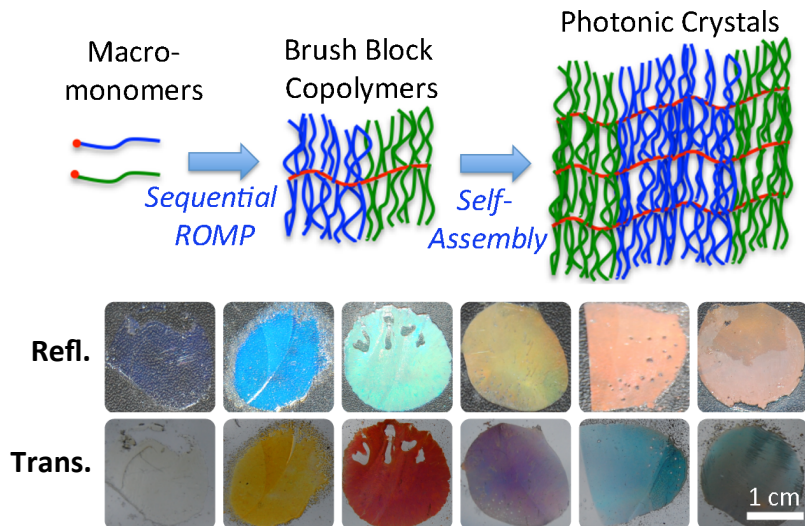


'Paintable' Polymer Photonic Crystals



Work was performed at Caltech

Scientific Achievement

We demonstrate the rapid self-assembly of brush block copolymers to lamellar nanostructures with photonic bandgaps spanning the entire visible spectrum, from ultraviolet (UV) to near infrared (NIR).

Significance and Impact

This work represents a significant step towards truly paintable polymer nanostructures, enabling an inexpensive route to large-area photonic crystals. These polymers could be developed into NIR-reflective paints to combat the “urban heat island effect” due to NIR photon thermalization.

Research Details

- The brush polymer architecture drastically reduces polymer chain entanglement, facilitating assembly
- The synthetic tunability of this system enables “bottom-up” fabrication of photonic crystals with application-tailored bandgaps

B.R. Sveinbjörnsson, R.A. Weitekamp, G.M. Miyake, Y. Xia, H.A. Atwater, R.H. Grubbs, *PNAS* **109**, 14332–14336 (2012).