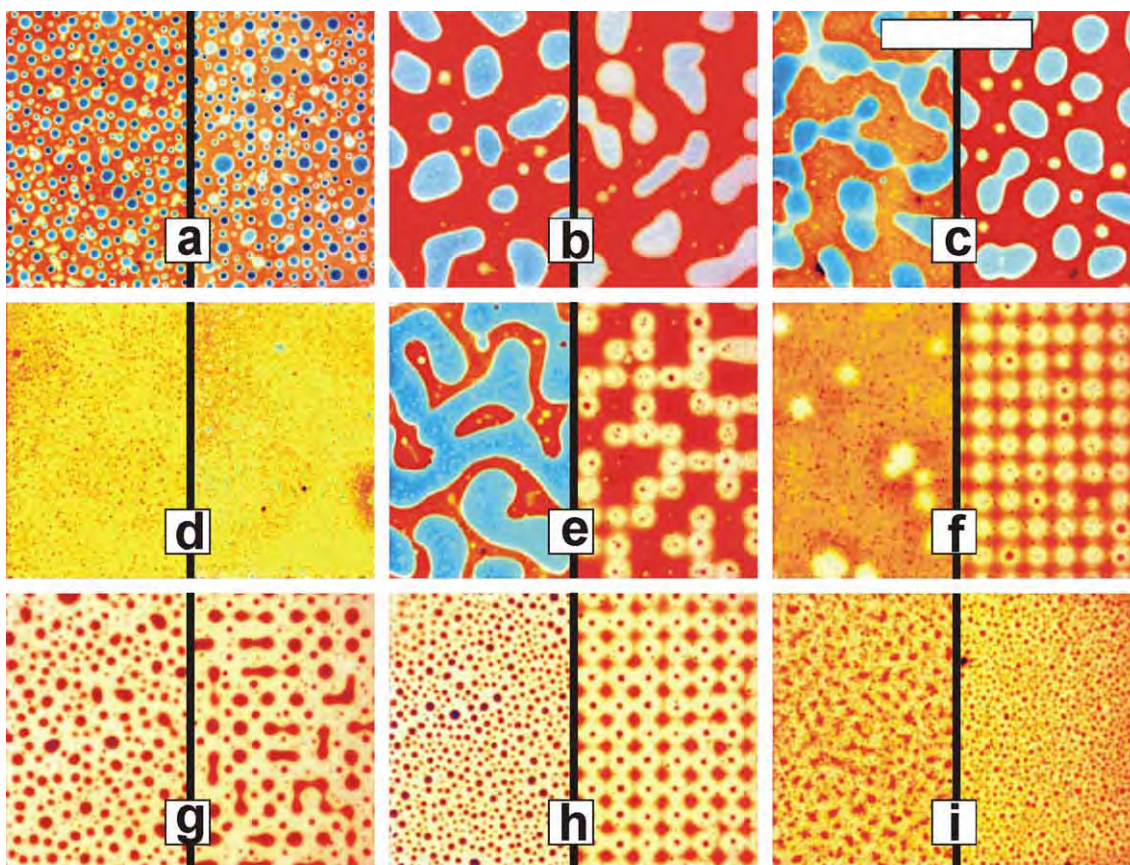


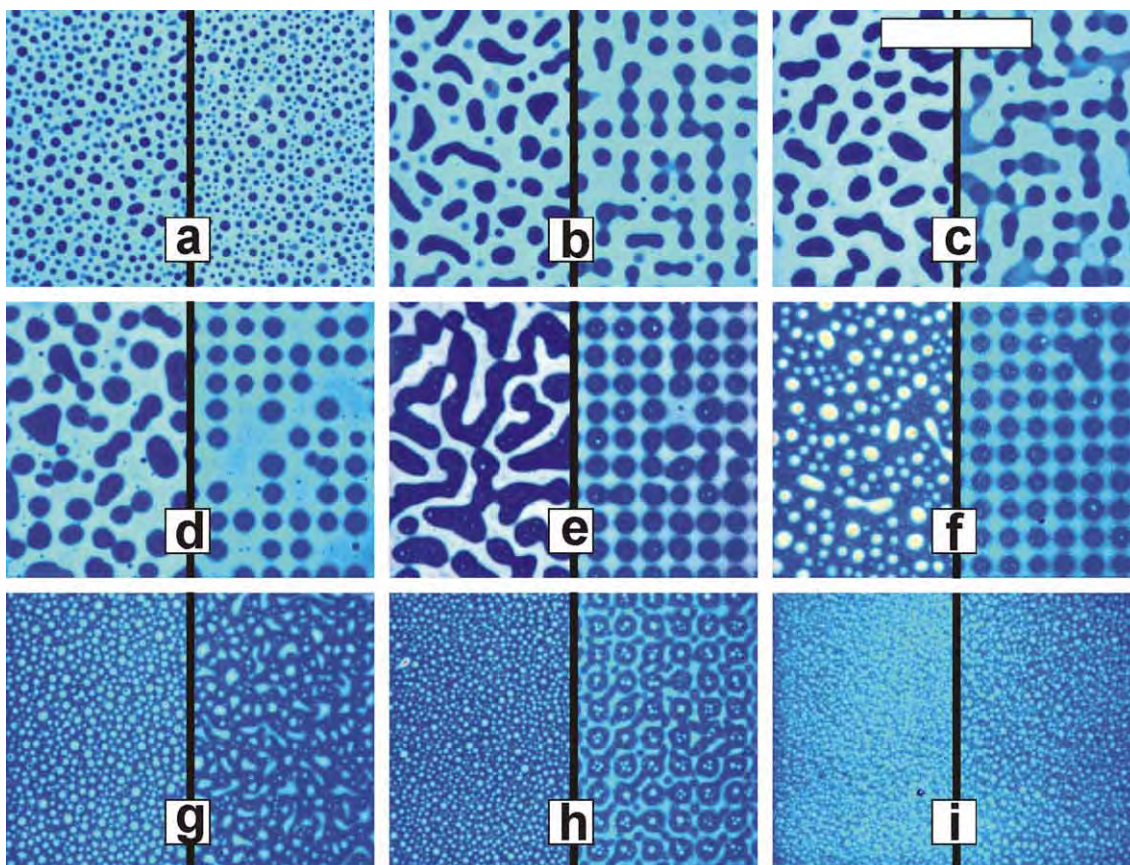
## **Polymer Phase Separation on Lattice Patterned Surfaces**

**Piers Andrew\* and Wilhelm T. S. Huck**

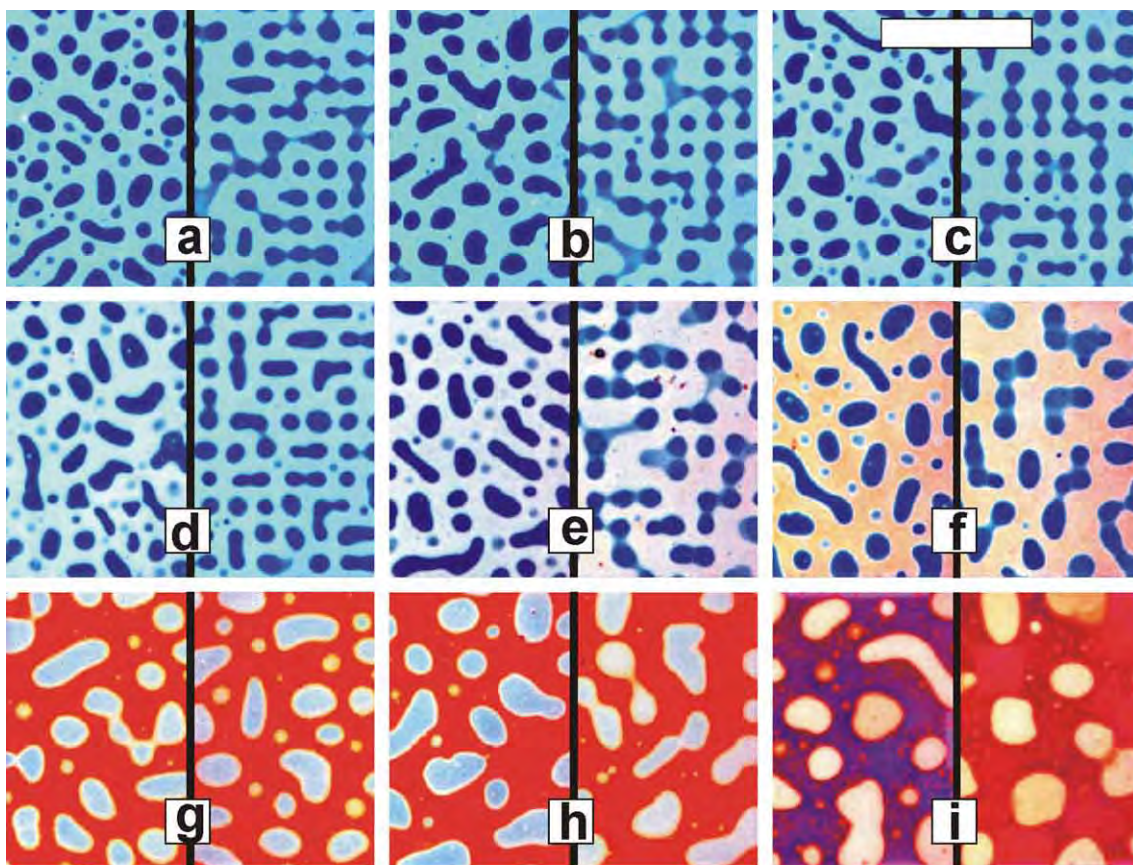
**Figures S1–S5: Optical microscope images of the full sample set.**



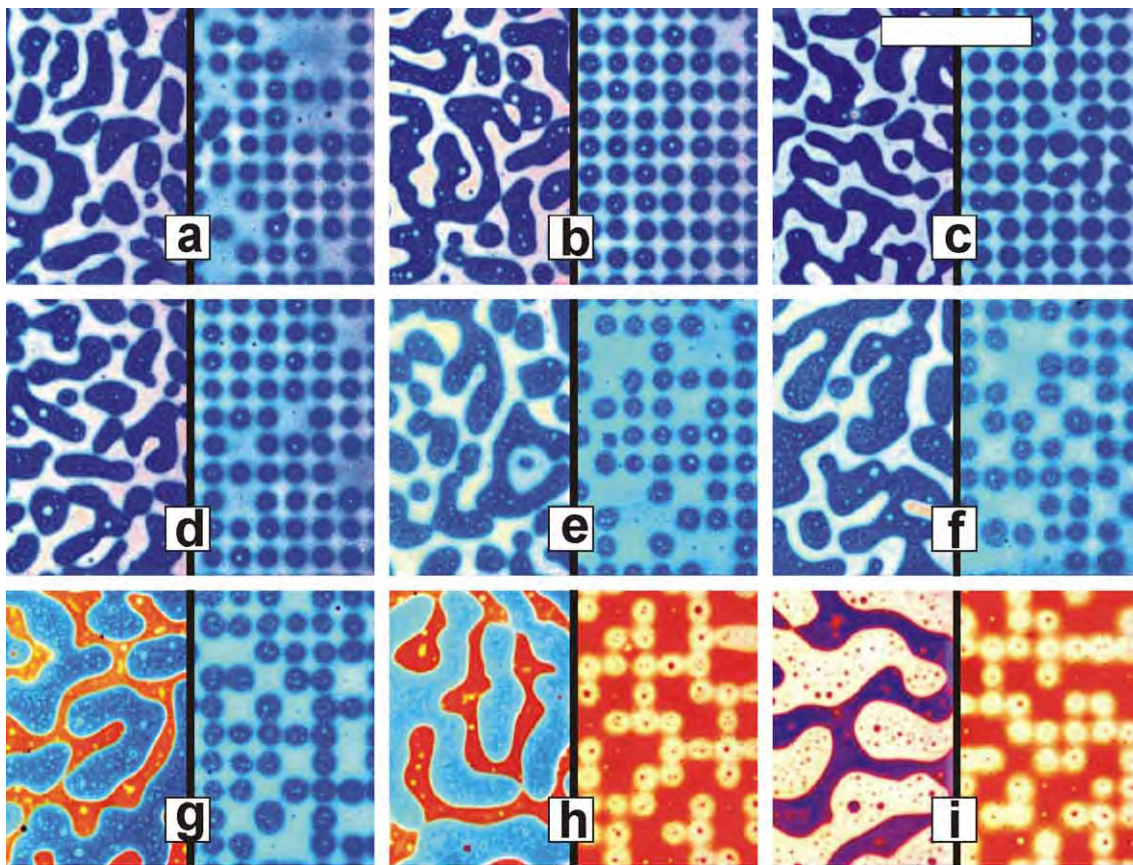
**Figure S1** Optical microscope images of 200-nm-thick phase-separated PS-PVP blend films for PS mass composition  $\phi_{\text{PS}} =$  (a) 0.2, (b) 0.25, (c) 0.3, (d) 0.4, (e) 0.5, (f) 0.6, (g) 0.7, (h) 0.75, and (i) 0.8. In each case, the left hand image is the homogeneous  $\text{CH}_2\text{-SAM}$  substrate and the right-hand image the patterned substrate. All images have the same scale, bar 20  $\mu\text{m}$ . The transition from hole, through bicontinuous, to island morphologies as  $\phi_{\text{PS}}$  increases can be clearly seen for the blend films on homogeneous substrates.



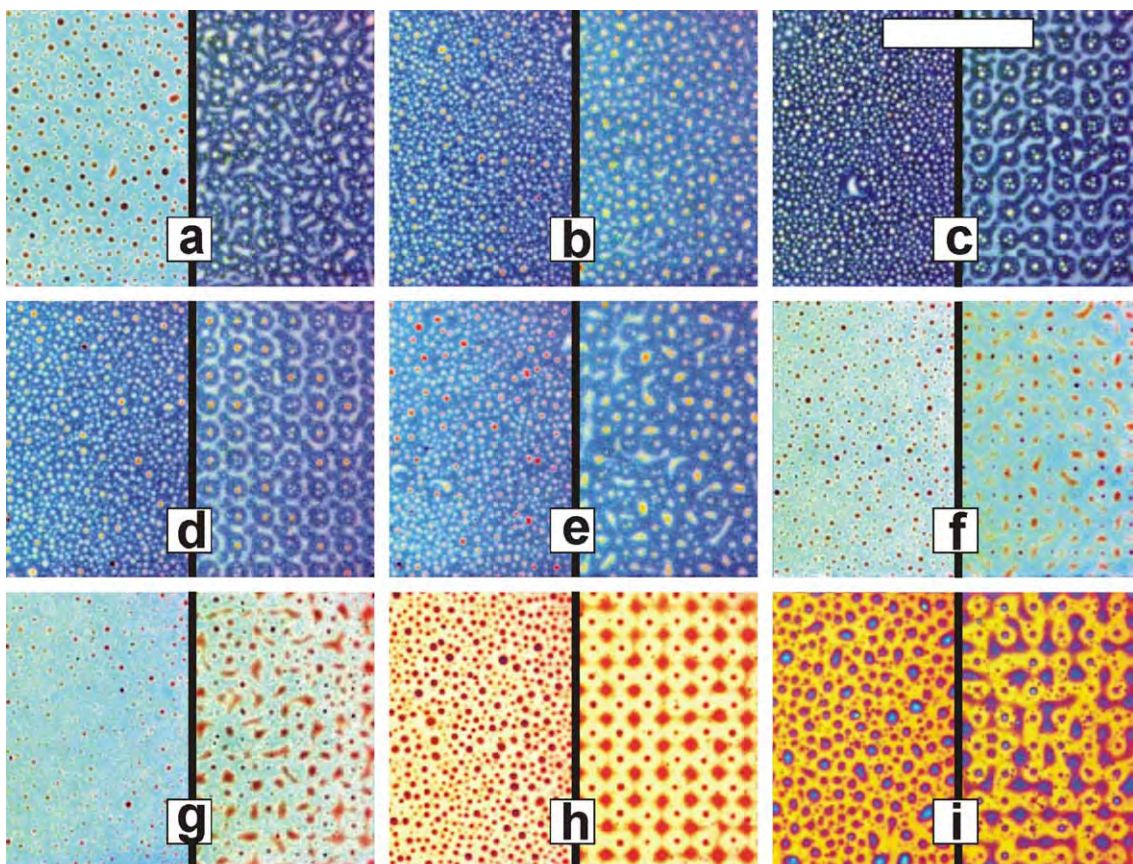
**Figure S2** Optical microscope images of 140-nm-thick phase-separated PS-PVP blend films for PS mass composition  $\phi_{\text{PS}} =$  (a) 0.2, (b) 0.25, (c) 0.3, (d) 0.4, (e) 0.5, (f) 0.6, (g) 0.7, (h) 0.75, and (i) 0.8. In each case, the left hand image is the homogeneous  $\text{CH}_2\text{-SAM}$  substrate and the right-hand image the patterned substrate. All images have the same scale, bar 20  $\mu\text{m}$ . As in figure S1, the transition from hole, through bicontinuous, to island morphologies with increasing  $\phi_{\text{PS}}$  can be clearly seen for the blend films on homogeneous substrates.



**Figure S3** Optical microscope images of phase-separated PS-PVP blend films with  $\phi_{PS}=0.25$  for mean film thicknesses  $d$  = (a) 123 nm, (b) 129 nm, (c) 140 nm, (d) 147 nm, (e) 164 nm, (f) 177 nm, (g) 183 nm, (h) 200 nm, and (i) 210 nm. In each case, the left hand image is for the homogeneous  $\text{CH}_2\text{-SAM}$  substrate and the right-hand image is for the patterned substrate. All images have the same scale, bar 20  $\mu\text{m}$ . The PS-phase hole domains increase in size with film thickness above  $d \sim 180$  nm (quantified in figure 5(b)), matching the loss of pattern-following observed for the patterned samples.



**Figure S4** Optical microscope images of phase-separated PS-PVP blend films with PS mass composition,  $\phi_{PS}=0.5$  for mean film thicknesses  $d =$  (a) 123 nm, (b) 129 nm, (c) 140 nm, (d) 147 nm, (e) 164 nm, (f) 177 nm, (g) 183 nm, (h) 200 nm, and (i) 210 nm. In each case, the left hand image is for the homogeneous CH<sub>2</sub>-SAM substrate and the right-hand image is for the patterned substrate. All images have the same scale, bar 20  $\mu\text{m}$ . The characteristic bicontinuous morphology associated with critical blend compositions (here,  $\phi_{PS}=0.5$ ) is obvious for the homogeneous substrates, and the length scale can be seen to increase with film thickness (quantified in figure 4(b)).



**Figure S5** Optical microscope images of phase-separated PS-PVP blend films with PS mass composition,  $\phi_{PS}=0.75$  for mean film thicknesses  $d =$  (a) 123 nm, (b) 129 nm, (c) 140 nm, (d) 147 nm, (e) 164 nm, (f) 177 nm, (g) 183 nm, (h) 200 nm, and (i) 210 nm. In each case, the left hand image is for the homogeneous  $\text{CH}_2$ -SAM substrate and the right-hand image is for the patterned substrate. All images have the same scale, bar 20  $\mu\text{m}$ .