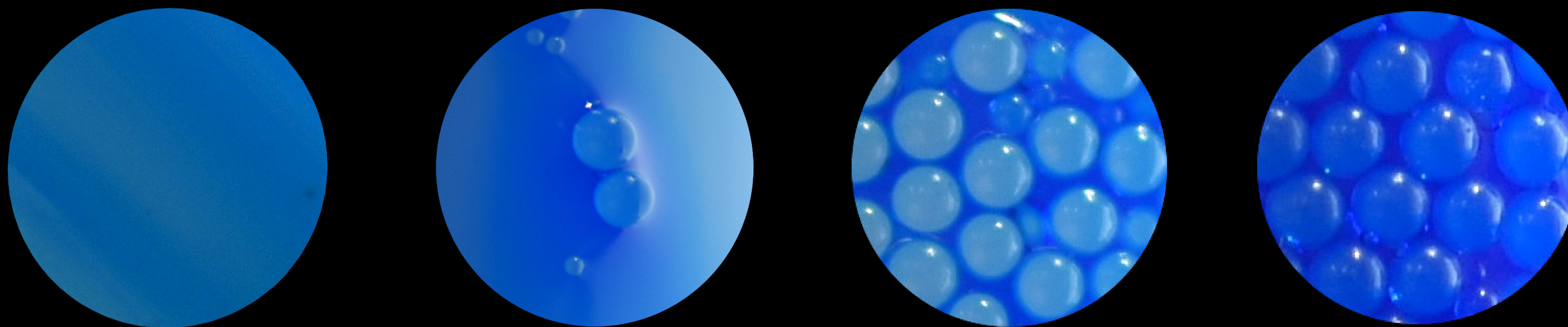


DIP COATING OF SUSPENSIONS: CAPILLARY ASSEMBLY OF PARTICLES

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Withdrawing a substrate from a suspension entrains a coating layer of liquid and particles on the solid surface. Here, a fiber is withdrawn from a suspension of neutrally-buoyant particles dispersed in a liquid phase. By tuning the capillary number, i.e., the ratio of viscous to capillary effects, different coating regimes are obtained. (i) At small capillary numbers, no particles are entrained, and only a liquid film coats the fiber (top left picture). (ii) At intermediate capillary numbers, the coating is heterogeneous with clusters of particles decorating the surface of the fiber (two bottom pictures). (iii) At large capillary numbers, multiple layers of particles are entrained (top right picture). This situation shows the complex interplay between capillary effects and particles. Dip coating of suspensions provides a new and robust strategy to control surface patterning and coating functionalities.