

Figure 1: Scanning electron microscopy image (SEM) of the top view (close packed hexagonal plane) of the colloidal crystal film formed by the developed high-T convective deposition using 410-nm silica microspheres. Note the perfect long-range arrangement of the monodisperse microsphere packing in a colloidal crystal film.

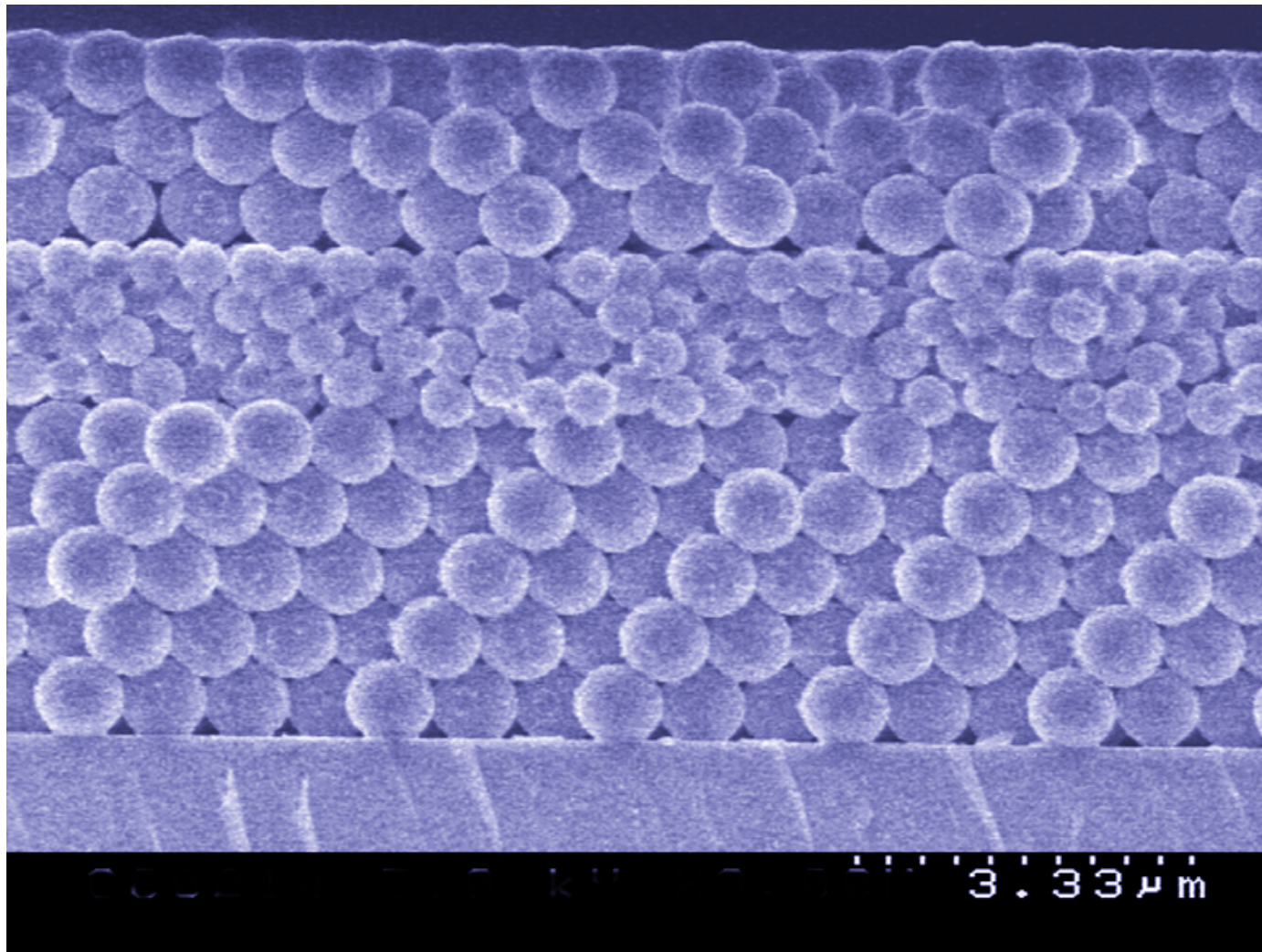


Figure 2: Scanning electron microscopy image (SEM) of the side view (cross-section) of the colloidal crystal film formed by consecutive depositions of 3 layers of different microspheres illustrating universality and versatility of the developed procedure for preparation of complex high-quality colloidal crystals.

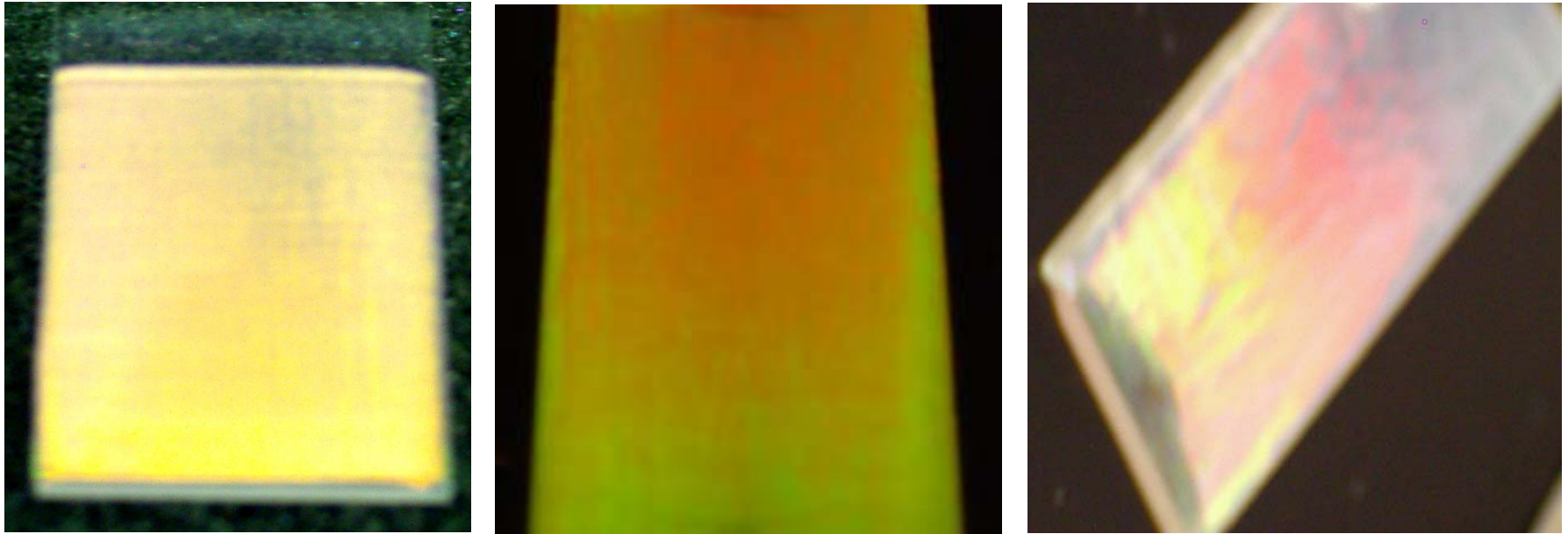


Figure 3: Optical photographs of the colloidal crystal films deposited on glass slides illustrating remarkable optical properties, and specifically uniformity of the films. (Left: yellow colloidal crystal films as one of the most challenging colors to achieve in opals, formed by 260-nm silica microspheres. Center and right: opals formed by larger 480-nm and 710-nm silica microspheres, illustrating diverse colors of high-order photonic bands.) Note that the colloidal crystal (opal) colors are angle-dependent.

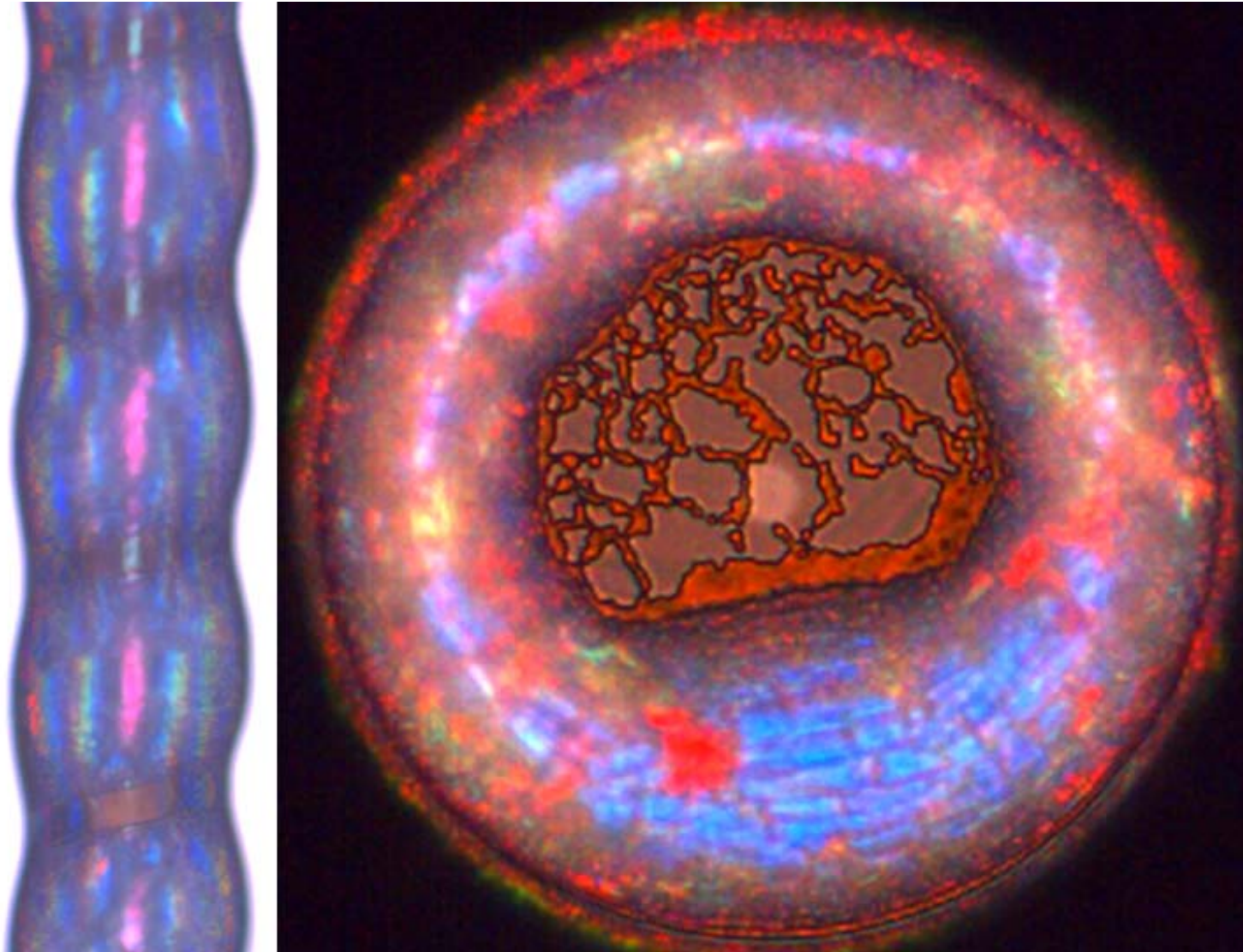


Figure 4: Optical microphotographs of several attempts to deposit colloidal crystals on photonic fibers resulting in a donut and a bean, illustrating the beautiful colors of opals so formed. The diameter of the donut and the thickness of the bean are approximately 125 microns (300X magnification).: