tion of polychromatic light, it would be possible to utilize broader wavelength ranges, maintain high transmissivity through use of wavelengths farther from the edges of the photonic bandgaps, take advantage of the reduction in nonlinearity to simplify the positioning of optical components, and take advantage of larger crystal spatial periods to further simplify fabrication. The design parameters that could be varied to obtain the desired properties include the angle of incidence, the angle of the exit surface, and the thicknesses of the layers.

One-dimensional photonic crystal superprisms for visible and infrared wavelengths could be fabricated on semiconductor wafers and, hence, could be integrated monolithically with other miniature optical components. In one example of this approach, a 1D photonic crystal superprism would be fabricated by patterning and anisotropic etching of one of two silicon layers of a silicon-on-insulator substrate (see Figure 2). In this case, the insulator (SiO$_2$) would not only provide structural support, because the index of refraction of SiO$_2$ is lower than that of Si, the SiO$_2$ layer would also act as an optical cladding layer to confine light to the 1D photonic crystal.

This work was done by David Z. Ting of Caltech for NASA’s Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1), NPO-30594.