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**Self-assembly of colloidal spheres on a cylinder** NABILA TANJEEM, HENRY WILKIN, VINOTHAN N. MANOHARAN, Harvard Univ — We study crystal growth on a cylindrical surface in order to understand how the geometrical constraints give rise to different types of structures. In our experimental system, submicron-sized colloidal spheres assemble into hexagonal lattices on a drawn silica fiber a few micrometers in diameter. The assembly is driven by a short-ranged depletion interaction between the spheres and between the spheres and fiber. Because a cylinder has zero Gaussian curvature and can accommodate a finite number of particles around its circumference, different crystalline structures assemble, depending on the ratio of the particle diameter to the cylinder circumference. In particular, we observe crystals of different chirality and crystals with defects that arise from packing constraints imposed by the cylindrical geometry. We demonstrate how these crystals grow and how the defects form. We also show preliminary simulations and experiments on crystal growth on tapered cylinders.

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