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Curved space crystallography at an oil-water interface WILLIAM IRVINE, STEFANO SACANNA, YAEL ROICHMAN, ANDREW HOLLINGSWORTH, MARK ELSESSER, Center for Soft Matter Research, New York University, MARK BOWICK, Physics Department, Syracuse University, DAVID GRIER, PAUL CHAIKIN, Center for Soft Matter Research, New York University — We study two-dimensional crystallography on a curved oil-water interface. Charged hydrophobic (PMMA) colloids in an oil phase (cyclohexyl bromide) are attracted, without wetting, by image charge effects to an oil-water interface. The micron size spheres form a monolayer on the interface and interact via screened coulomb interactions to form a crystalline lattice. We create a curved oil-water interface by controlling wetting conditions between a water droplet and a substrate or support, to produce interfaces of both constant and varying gaussian curvature with boundary. We simultaneously image and manipulate the full crystal on the curved surface using a setup capable of simultaneous holographic optical tweezing and confocal imaging. We study the resulting dynamics of topological defects.

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