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**Phase Behavior of 2D Charged Hydrophobic Colloids in Flat and Curved Space** COLM KELLEHER, RODRIGO GUERRA, PAUL CHAIKIN, Dept. of Physics, New York University — Charged hydrophobic colloids, when dispersed in oil with a relatively high dielectric constant, can become highly charged. In the presence of an interface with a conducting aqueous phase, particles bind strongly to the interface via image-charge attraction. At sufficiently high density, these charged interfacial particles self-organize into a 2D repulsive (Wigner) crystalline solid phase, while at lower densities, the particles form a 2D fluid. By observing samples prepared at different densities, we can probe various points in the phase diagram of this soft 2D material, and compare our results with applicable theory and simulations. In this talk, we present two sets of experiments we have performed on this system: first, we show how we can use gravity as an external force to create a controlled density gradient, and thereby directly measure the equation of state and other quantities of interest. Second, we discuss how, by observing particles which are bound to the surface of spherical droplets, we can explore how the presence of finite background curvature affects the phase behavior of the system.

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