1067-AE-1602 **Andrew J. Bernoff*** (ajb@hmc.edu), Department of Mathematics, Harvey Mudd College, 301 Platt Blvd., Claremont, CA 91711. *Langmuir Layers: Exploring a (nearly) Two-dimensional Fluid Experiment.*

A Langmuir Layer is a molecularly thin layer of a polymer, lipid or liquid crystal on the surface of another fluid. In this (nearly) two-dimensional layer, we can observe bubbles of a fluid phase that even when stretched or highly contorted always appear to return to a circular shape. The force driving these evolutions is line tension, a two-dimensional analog of surface tension. We report on a combined experimental, theoretical, and numerical study of Langmuir layers, and show how we can deduce the strength of the line tension in the system by comparing theory and experiment. As time permits we will also describe other phenomena observed in Langmuir systems, including collapse of gas phase bubbles, co-existence of three or more fluid phases, and formation of dogbone and labyrinth patterns due to dipolar repulsion in the layer. (Received September 21, 2010)