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**John A Pelesko\*** (pelesko@math.udel.edu), 406 Ewing Hall, Department of Mathematical Sciences, Newark, DE 19716. *Notes from the MEC Lab at the University of Delaware.*

In the Department of Mathematical Sciences at the University of Delaware, we are fortunate to host an experimental laboratory. This lab, called the “MEC Lab,” exists to help students, postdocs, and faculty experience the interplay between modeling, experiment, and computation. In this talk, we will describe recent experiments in electrostatic-solid interactions, fluid dynamics, and solidification, that are being conducted by undergraduate and graduate students. We will explain the mathematics associated with these experiments and how this work is incorporated into our courses and research programs. (Received September 16, 2009)