# FARADAY'S LAW LAB #3

(L-87)

This is a multiple-pronged lab designed to allow you to become more familiar with magnetic induction and Faraday's Law.

## PROCEDURE--DATA

**Instructions:**

**1.)** Go to https://phet.colorado.edu.
**2.)** At the top of the page, use the SIMULATION pull-down and click on HTML5.
**3.)** Find and open the FARADAY'S LAW PhET page.
**4.)** Open the lab.
**5.)** Turn on the "Field Lines" option (it's at the bottom of the page).

**Part A:** (light up the bulb)

**a.)** Move the bar magnet vertically. You should notice that there is no voltage registered on the meter, and the light bulb does *not* light up. Using the idea of *magnetic flux* and Faraday's Law, explain what MUST be happening in this situation (remember to blurb and write complete sentences—I don't want no slop lab at this late stage of the game).

**b.)** Now orient the magnet on level with the coil so the *north pole* is nearest the coil and the magnet as a whole is on the far right side of the page. Observe what happens to both the voltage and the light bulb when you SLOWLY move the magnet toward the coil? Explain what you've observed using Faraday's Law.

**c.)** Repeat *Part b* moving the magnet toward the coil QUICKLY. Again, report what you see, then explain using Faraday's Law.

**d.)** Put the magnet into the coil. Once there, observe what happens to the voltage and light bulb when you quickly pull the magnet out of the coil to the left? Is there any difference in what you observed in this step and what you observed in *Part c*? If so, what was the difference? Explain using Faraday's Law.

**Part B:** Watch the video zPoly: 680 dL. After having done so:

**e.)** Use Faraday's Law to explain what must be happening inside the aluminum ring when it is placed along the axis of the coil.

**f.)** What is actually happening with the ring when it rockets upward as "the button is pushed?"