**PHYS 1220-02 Group Work Sheet**
**Electrostatics**

## 1. Charge-Charge Forces

**Equipment**: two balloons, one suspended by a thread, fur

1.1. Charge a balloon suspended by a thread by rubbing it with fur. Hold another balloon in your hand and charge it in the same manner. Slowly bring the balloon in your hand toward the suspended balloon. What happens?

1.2. Re-charge the suspended balloon by rubbing it with fur. Remove the fur piece and then slowly bring it toward the balloon. What happens?

1.3. Rub a balloon in your hair. Slowly pull the balloon away from your head. What happens?

## 2. Electric Field Visualizer

**Equipment**: electric field visualizer bottle, stand, glass and plastic rods, balloons

Place the visualizer bottle on a stand to isolate it. Charge a balloon by rubbing it with fur. Hold it next to the electric field visualizer bottle. In a little while, the fibers suspended in the oil in the bottle will align with the electric field surrounding the charge.

2.1. Sketch the pattern of the fibers in the bottle, also indicating the position of the charged object.

2.2. Generate a different field around the visualizer bottle. You may do this by placing two balloons in different positions around the bottle, placing opposite charges in different positions around the bottle, placing an uncharged piece of metal under the bottle as a charged rod is held near the bottle, and so on. Sketch the pattern of the fibers in the bottle, also identifying and indicating the positions of the other objects.

## 3. Electric Charge Polarization

**Equipment**: glass or plastic rod, fur, bubble soap, stream of water, empty aluminum can

Charge a balloon by rubbing it with fur.

3.1. Hold the charged object near a thin stream of falling water. What happens?

3.2. Blow soap bubbles in air. Bring the charged balloon near the bubbles. What happens?

3.3. Place an empty aluminum can on its side on a level surface, so that it can roll freely. Bring the charged balloon near the side of the can. What happens?