

## PHYSICS 190: MECHANICS and HEAT; Lab 10: The Ideal Gas Law and Absolute Zero

### 1. Set up

- a. Materials needed: thermometer, absolute zero apparatus, hot plate and two (2 liter beakers)
- b. Fill one beaker approximately  $2/3$  full with water and then heat it on hot plate
- c. Fill the other beaker approximately  $2/3$  full with ice water

### 2. Measurements

- a. Measure and record room temperature and pressure reading on the absolute zero apparatus
- b. Measure and record temperature of the boiling water and pressure reading on the absolute zero apparatus when it is immersed in the boiling water
- c. Measure and record temperature of the ice water and pressure reading on the absolute zero apparatus when it is immersed in the ice water

### 3. Analysis

- a. Using a spreadsheet produce a graph of the pressure as a function of temperature
- b. Curve fit the data using a linear function and record the equation of the line
- c. Using the equation of the line determine the temperature if the pressure equals zero

### 4. Questions

- a. What is the value of the temperature given by your calculation in part "3.c"?
- b. Calculate the percent error between your value and the standard value.
- c. What is the expected range of error for this experiment?