

### PH115 Lab 3: ideal gases

For this lab, we will use the applet at <https://phet.colorado.edu/en/simulation/gases-intro>

#### Part 1: exploring variables

- Load the applet and choose “intro”
- Add some particles to the box (using the pump)
- How do you change the pressure (P)? Which variables influence it for a fixed number of particles (N)?
  - How does the pressure depend on the other variables?
    - Volume (V)? Change the size of the box.
    - Particle number (N)? Open the box.
    - Temperature (T)?
- What changes when you add more particles?

#### Part 2: interdependence of variables

- Go to the “laws” portion of the applet (bottom of window)
- Add some particles to the box
- Keep the volume (V) constant. What happens if you raise the temperature (T)?
- Keep the temperature (T) constant. What happens if you change the volume?
- Fix  $P \updownarrow V$ , and add heat (change temperature). What happens?
- Fix  $P \updownarrow T$  and change the size of the box. What happens?

What is the overall relationship between the variables P, V, N, T?