# Ideal Gas Law

Lecture Notes (Math 142-1)

November 30, 2015

## 1 Mixture of gases

- Particles do not interact
  - Gases do not interact with each other
  - But the gas molecules will collide
  - Constituent gases will be at same temperature (empirical)
- Partial pressure
  - Each type of gas applies force on the walls of container
  - These forces add
  - The per-gas forces are partial pressures
  - Their sum is total pressure
- Relationship between $KE$ and $P$ is still valid per type of gas
- What about the relationship between $KE$ and $T$?
  - Scenerio I
    - Box, divided in two by a membrane, same gas on each side, same temperature
    - Result: gas at same temperature, homogeneous, no loss of $KE$
  - Scenerio II
    - Box, divided in two by a membrane, different gas on each side, same temperature
    - Result: gas at same temperature, mixed, no loss of $KE$
  - Relationship between $KE$ and $T$ is the same for single gas and mixture
- Ideal gas law holds per component gas