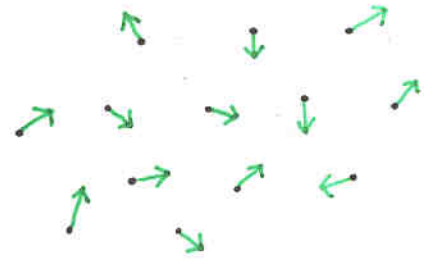


Lecture 3: Planetary Atmospheres

The atmospheres of the planets (and the Sun) can be modelled as an **IDEAL GAS**:

point particles (e.g. atoms, molecules)
interacting through perfectly
elastic collisions



Equation of State

$$PV = NkT$$

P = gas pressure [Pascals (Pa) = Newtons m^{-2}]

N = number of particles V = volume of gas

T = temperature [in Kelvin]

k = Boltzmann constant = $1.381 \times 10^{-23} \text{ J K}^{-1}$

We can also write :-

$$P = nkT$$

and

$$n = \frac{\rho}{\bar{m}}$$

Mass density
of gas

number density
of gas particles = $\frac{N}{V}$

average mass of a gas particle