1.2 Zero's Axiom of Thermodynamics

- Thermal equilibrium exists
- It is characterized by a universal temperature
- Within a system thermal equilibrium is formed
- Two systems in thermal contact will exchange heat energy ⇒ a universal temperature in both systems result
- This exchange process allows for temperature measurement with a thermometer
- This exchange process is transitive; i.e. if a system is in thermal equilibrium with two other systems, both systems are in thermal equilibrium with each other (⇒ This allows to compare systems of the same temperature)
- Temperature measurements can e.g. be performed with a gas thermometer: For an ideal gas in thermal contact with another system one can e.g. measure the volume; applying the formula

$$pV = nRT \tag{1.1}$$

  this defines the temperature of the gas.
- But: the heat exchange can disturb the measured system