

## 12.3: Stellar Birth

There are relationships between pressure, temperature, and volume in a gas like interstellar medium:



### Where:

- This relationship shows that as the pressure ( $P$ ) increases, the temperature ( $T$ ) increases and the volume decreases ( $V$ ).

As the pressure, density, and temperature increases, no thermal (heat) energy can easily escape. The rising pressure and density leads to the formation of a Protostar, where the core is not yet undergoing fusion. The star 'turns on' – *a star is born* – when the protostar's core temperature reaches 10,000,000 K; fusion begins as the proton-proton cycle.



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