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A microscopic theory of phase transitions

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Abstract content **(Max 300 words)** [Formatting & Special chars](http://events.saip.org.za/getFile.py/?target=_blank)

A microscopic theory of phase transitions is presented that describes macroscopic phenomena on the basis of microscopic interactions between particles. It is shown that the equation of state $p(T,V)$ of a gas and the spontaneous magnetization $M_S(T)$ of a ferromagnetic insulator only exhibit phase transitions in the thermodynamic limit thus describing an infinitely large system. There are no phase transitions observed in the case of a finite system. A Curie temperature is calculated in agreement with experimental realizations of the theoretical model. Furthermore, the results depend on the dimension d of the spin lattice thereby confirming the Mermin Wagner theorem.

Apply to be considered for a student award (Yes / No)?

no

Level for award (Hons, MSc, PhD)?

no

Main supervisor (name and email) and his / her institution

n.a.

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

no

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