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A microscopic theory of phase transitions

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Abstract content
 (Max 300 words)
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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.

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