

## **correlation length & exponent**

The correlation length  $\xi$  is the characteristic length of a correlated region. In a second-order phase transition the divergence of  $\xi$  close to the critical temperature  $T_c$  is characterized by a power law:  $\xi \sim (T - T_c)^{-\nu}$ . The exponent  $\nu$  controlling the divergence of  $\xi$  is called the **correlation length exponent**. In mean-field theory,  $\nu = 1/2$ .

### Polymer-Magnetic correspondence (De Gennes, 1973)

In polymer solutions, the correlation length  $\xi$  corresponds to the chain size  $R$ , the temperature difference  $T - T_c$  to the inverse chain length  $N$  and the correlation length exponent  $\nu$  to the Flory exponent.