# Nuclear Models

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- **Liquid drop model**: nucleons playing the role analogous to molecules in a drop of normal liquid (nucleus as an incompressible liquid droplet)
- **Surface tension**: an attraction of the surface nucleons towards the center
- Binding energy of nucleus:

$$B.E. = -a_1 A + a_2 A^{\frac{2}{3}} + a_3 \frac{Z^2}{A^{\frac{1}{3}}} + a_4 \frac{(N-Z)^2}{A} \pm a_5 A^{-\frac{3}{4}}$$

- Bethe-Weizsacker semi-empirical mass formula (predicts stability and masses of unknown nuclei):

$$M(A,Z)c^2 = (A-Z)m_n + Zm_p + \frac{B.E.}{c^2}$$