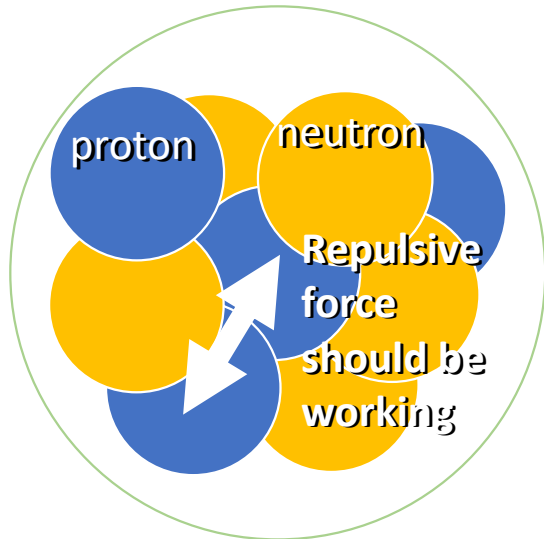
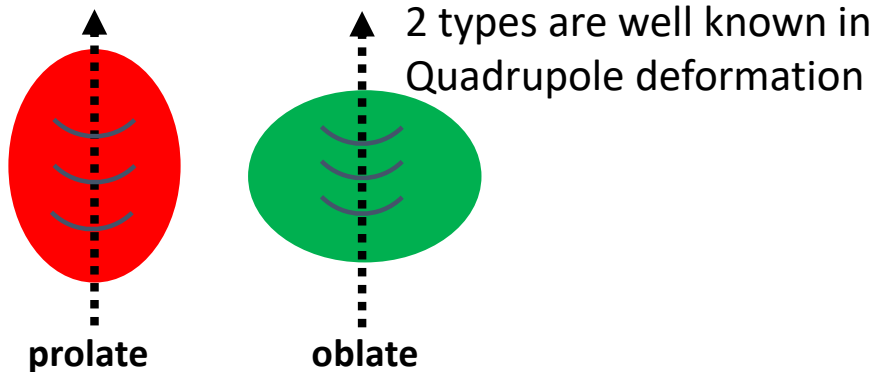


# Effect of the Coulomb interaction on nuclear deformation and drip lines



Nuclei are the **collection** of many particles. They have a lot of interesting properties such as **Deformation**.



We need to treat these **MANY-BODY system**

➔ **Density Functional Theory** is chosen in our research

**HFB equation**

$$\begin{pmatrix} h - \lambda & \Delta \\ \Delta^* & -h^* + \lambda \end{pmatrix} \begin{pmatrix} U_i \\ V_i \end{pmatrix} = e_i \begin{pmatrix} U_i \\ V_i \end{pmatrix}$$

In HFB equation,  $h$  and  $\Delta$  are **functional of density** which is expressed in terms of the **matrix elements  $U$  and  $V$** .

By diagonalizing the Hamiltonian and using the obtained eigenstates, the Hamiltonian is redefined.

## Interesting result

Intuitively, the Coulomb interaction, which is a repulsive force, is thought to destabilize nuclei, **HOWEVER**, it has been found that **some nuclei are actually more stabilized** in the presence of the Coulomb interaction.