Stacking nucleons inside a nucleus

• Nucleons have energy levels similar to the electrons inside atoms.
• Spin = $\frac{1}{2}$, so Pauli principle says: No two have same quantum numbers!
• Place neutrons and protons separately into levels. *So 4 nucleons fill the lowest level.*
• This forms the Helium 4 nucleus (AKA the alpha particle!)

• As more and more nucleons go into higher levels → positive charge of the protons already there repels new protons.
• Easier to add neutrons. But, they must go into higher orbitals, which costs energy.