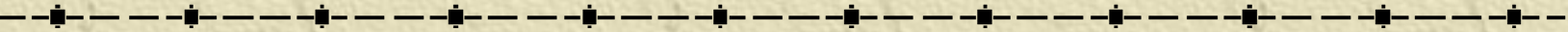




Our Energy Future

Nuclear Fission

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✦ What does nuclear mean?

In this case it means to do with the nucleus of
an atom.

In the atomic nucleus are protons and
neutrons.

If you think about it a nucleus shouldn't stay
together

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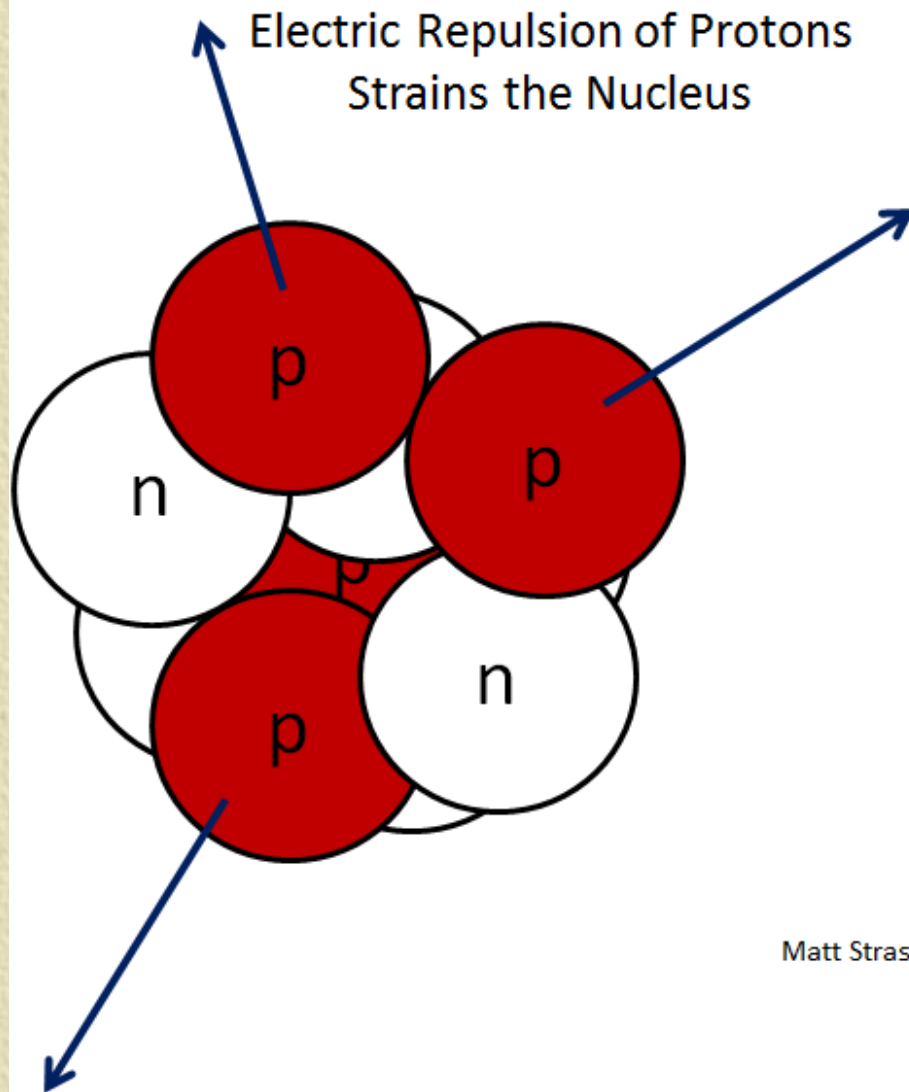
✦ Okay you've had some thinking time.
What's your answer?

Protons are positively charged ...

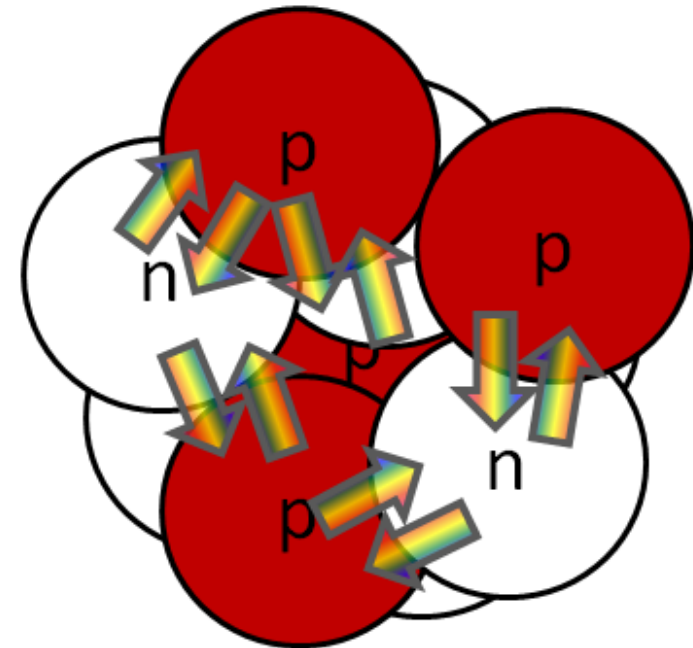
Things with the same charge repel each other. (Remember the Van Der Graff?)

Why doesn't the nucleus just fly apart?

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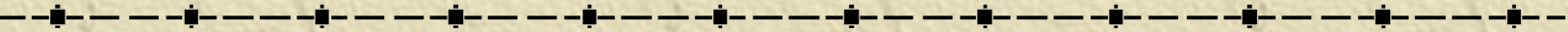
But The (Residual) Strong Nuclear
Force Holds the Nucleus Together



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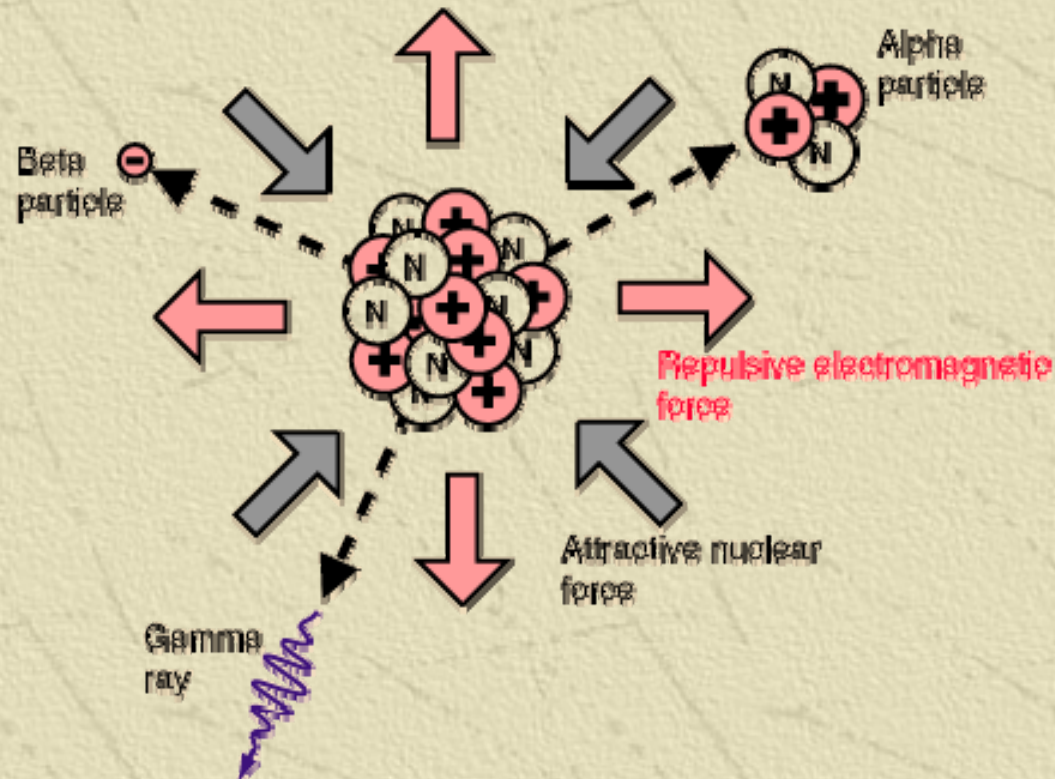
- ✦ This slide is an asideSort of.
- ✦ Most people think about nuclear processes leading to explosions.
- ✦ Nuclear explosions happen when there is an unrestrained chain reaction (remember the control rods) Here's a visualisation and another.

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- ✦ Most atoms have the correct number of neutrons to overcome the repulsion between the protons.
- ✦ Some atoms have too few or too many.
- ✦ These isotopes undergo natural radioactive decay.

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Unstable isotopes decay – they undergo fission.

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- ✦ Nuclear Fission means breaking an atom into parts.
- ✦ The released parts contain the energy that used to hold the nucleus together.
- ✦ This energy means they move very quickly
- ✦ They are hot!
- ✦ This heat can be used to generate electricity



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- ✦ However natural decay produces limited energy.
- ✦ But decay can be triggered to happen in some isotopes (eg U^{235}).
- ✦ Let's see if we can work out how this works

