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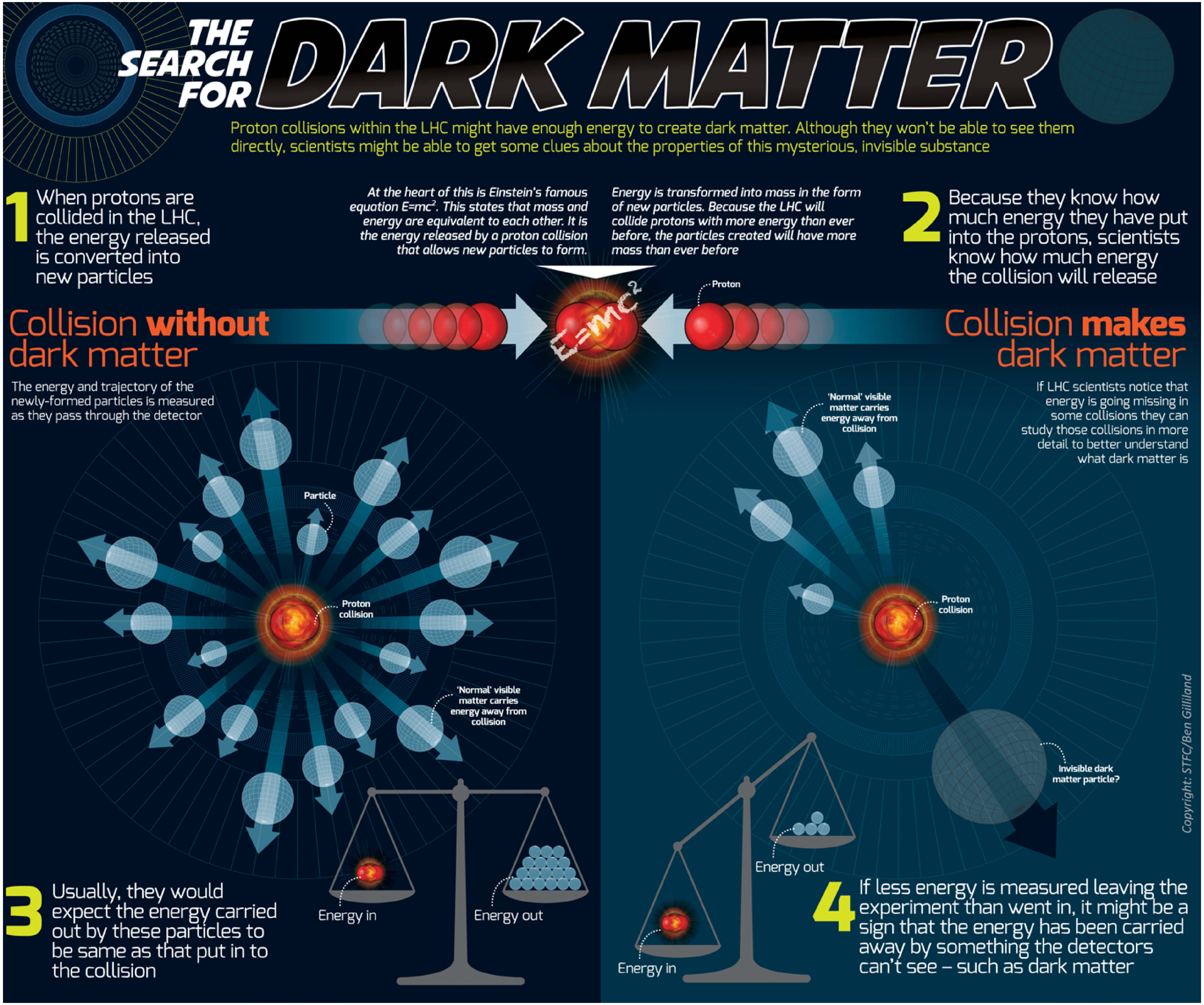

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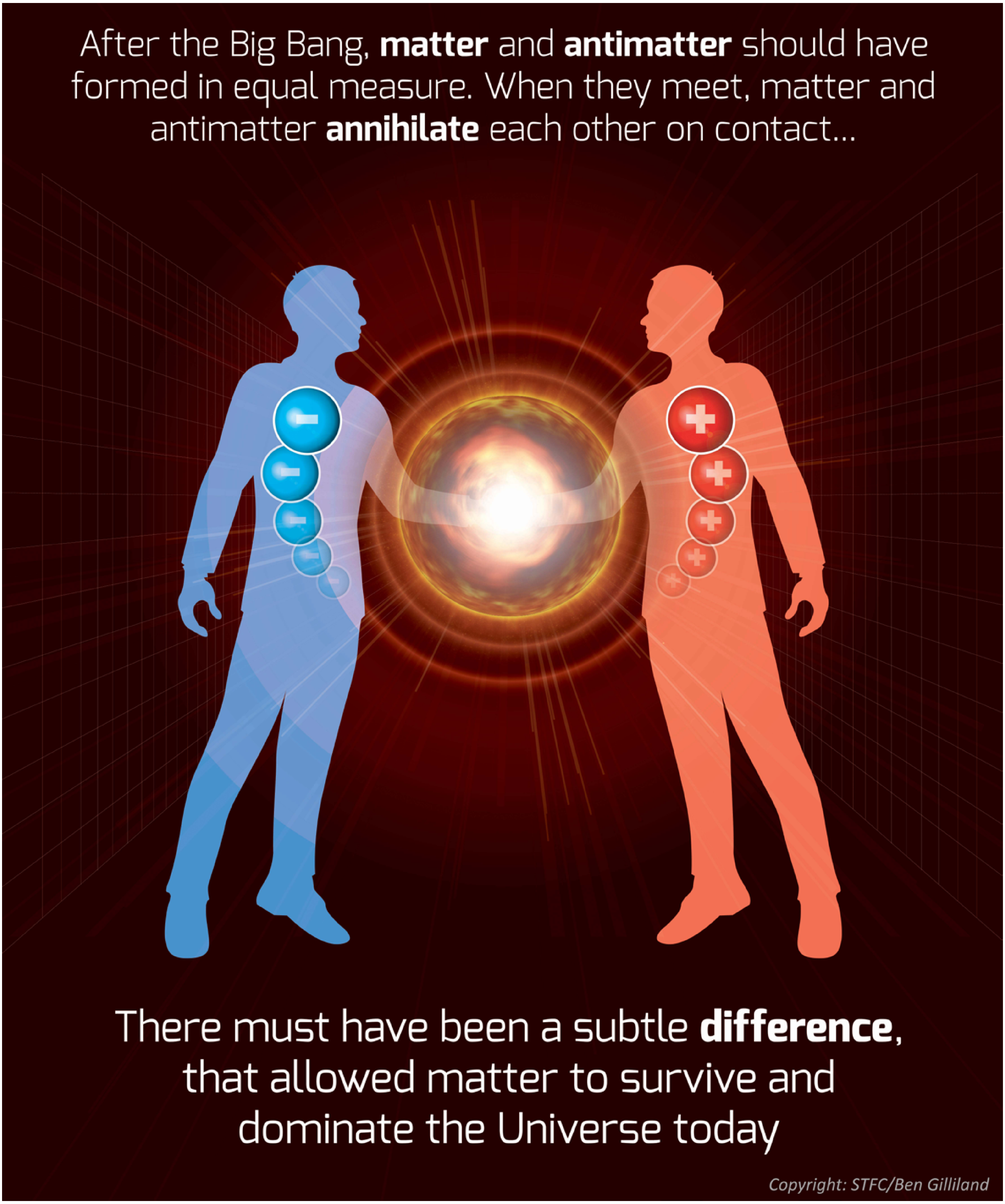

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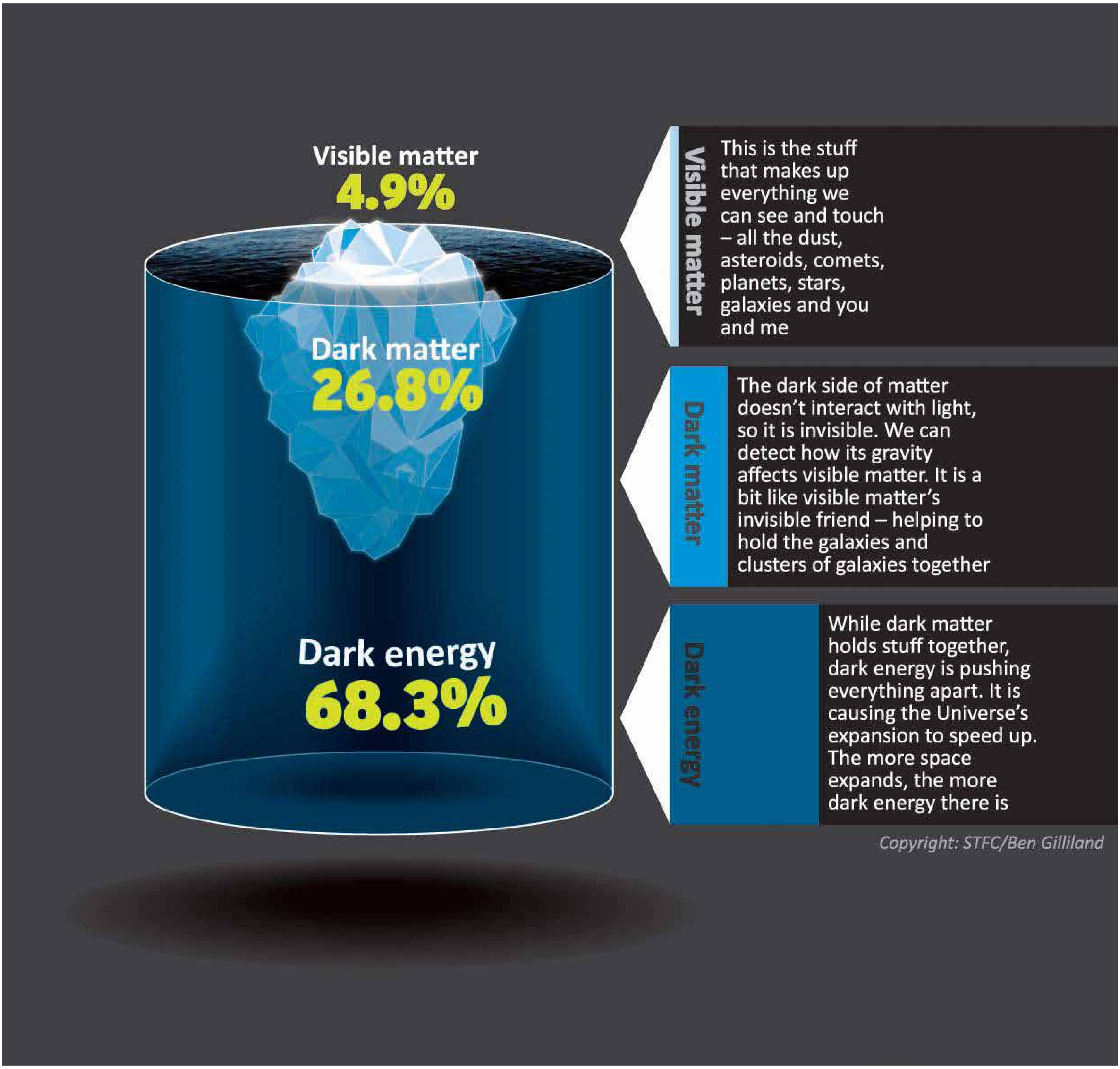

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THE HIGGS BOSON THE HUNT CONTINUES...

Although we have now found the **Higgs boson**, there's still a lot we **don't know** about it. The only way to find out those things is to make more Higgs bosons and examine them.

We do know

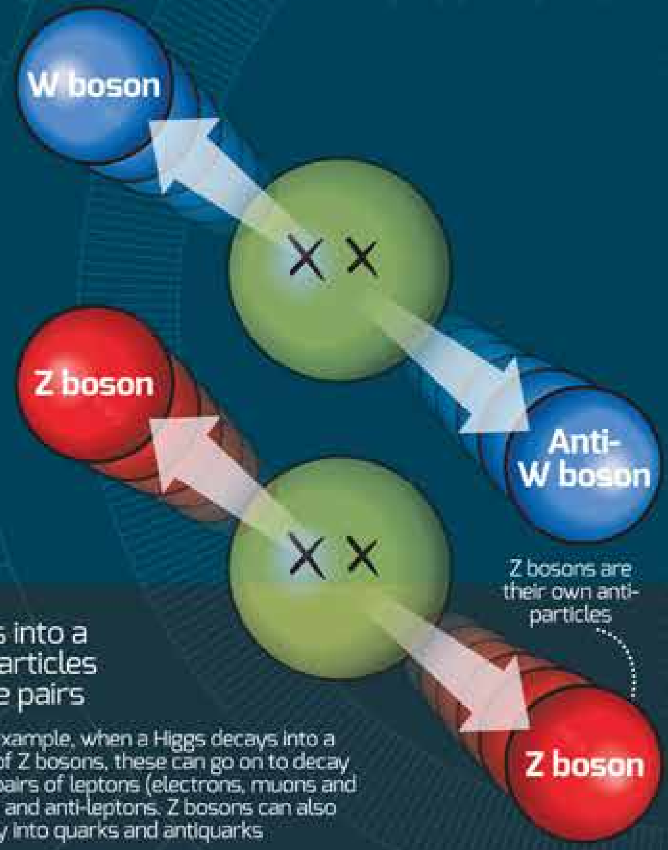
The Higgs is its **own** antiparticle

Most particles have an antimatter version. Some other bosons, such as the photon and Z boson are also their own antiparticles

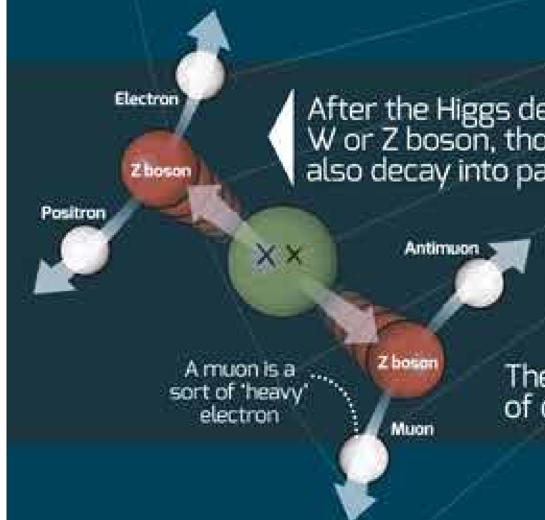
It has **zero** electric charge and **zero** spin

The Higgs decays into **W** and **Z bosons** at roughly the rate predicted by the Standard Model

This is important because it shows that the Higgs gives the bosons their mass



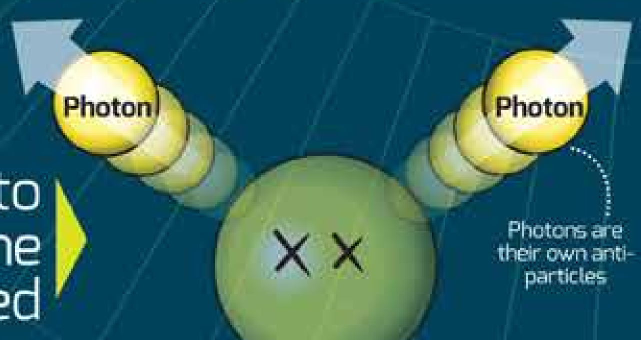
After the Higgs decays into a W or Z boson, those particles also decay into particle pairs



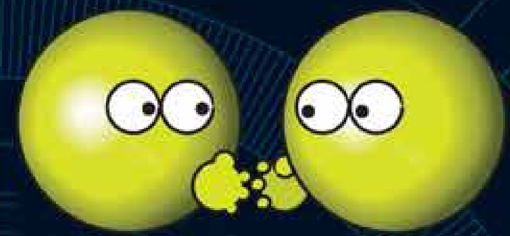
For example, when a Higgs decays into a pair of Z bosons, these can go on to decay into pairs of leptons (electrons, muons and taus) and anti-leptons. Z bosons can also decay into quarks and antiquarks

The LHC looks for this sequence of decay products

The Higgs decays into **photons** at roughly the rate predicted



We would like to know



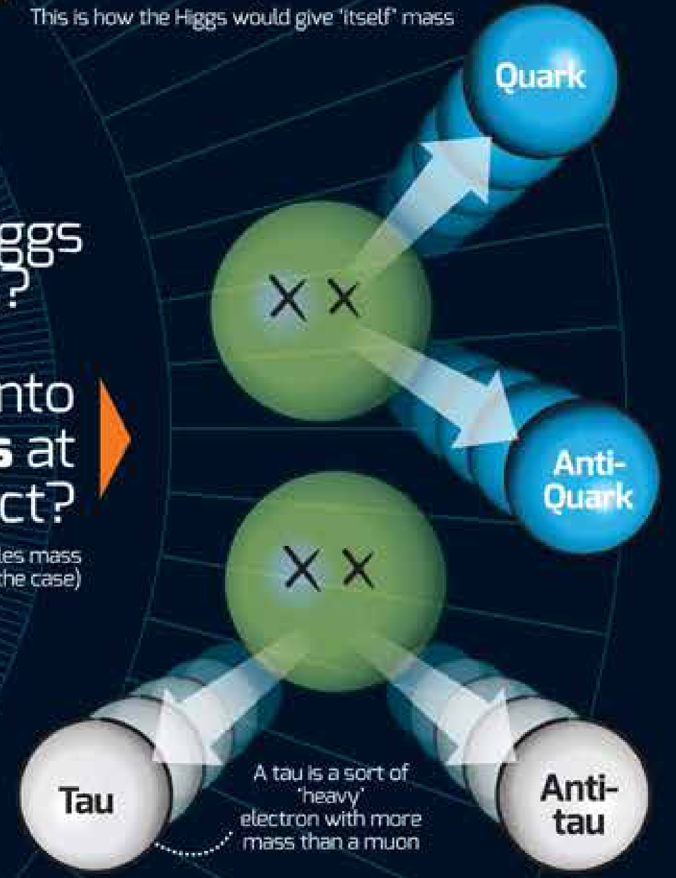
Does the Higgs **self-interact** in the way it is expected to?

This is how the Higgs would give 'itself' mass

How long does the Higgs **'live'** before it decays?

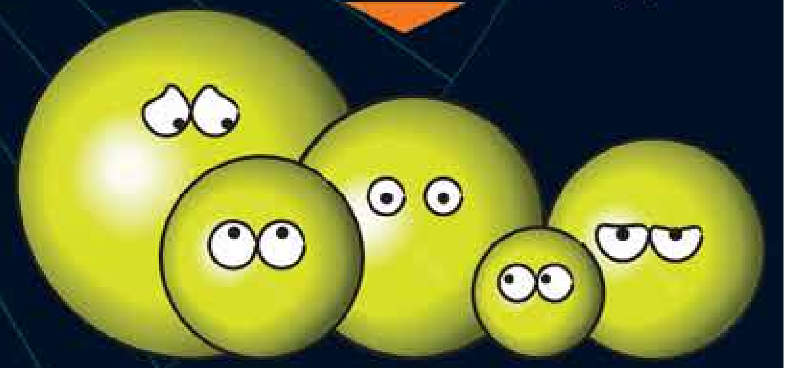
Does it decay into **quarks** and **leptons** at the rate we expect?

This would tell us whether the Higgs gives these particles mass too (there is some evidence that this is the case)



Is the Higgs really a **fundamental particle**, or is it made of something we haven't seen yet?

Is it the **only** Higgs boson, or are there other types?



Does the Higgs particle give mass to **Dark Matter**?

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