ILLUSTRATION: LUKE INSECT

HOW TO...

build your own fusion reactor

You'll need a vacuum chamber (try eBay or a friendly university), a high-voltage power supply (such as those used by neon signs) and two concentric wire-frame spheres – the actual fusor. Careful though! **Robin Hague**

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Making the fusor
Aptly enough, once assembled this often looks like a small model of electron orbits around an atom. The fusor must be connected to the high-voltage power supply through an insulated connection in the earthed vacuum chamber.

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Stepping on the gas
Now for the fuel: deuterium gas. Evacuate the chamber and let a small amount of gas in, then turn on the power. The high voltage pulls electrons into the centre of the chamber, making a virtual electrode inside the wire spheres.

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Achieving fusion
In turn, this attracts the positively charged gas atoms through the gaps in the fusor and then into the electron cloud. The atoms return over and over again, getting faster all the time. Eventually, they collide together fast enough to fuse.

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Detecting neutrons
To check your reactor works, you'll need a bubble neutron detector. This is a small container of jelly that bubbles when a fusion-produced neutron passes through it. Leave it by the machine for a while but don't stand close

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Fuse with others
Network with the wider amateur fusion community at *fusor.net*. You could take inspiration from American high-school pupil Thiago Olson, who achieved fusion four years ago using equipment sourced on eBay and in hardware shops for just $3,000.

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Know the risks
Risks involve those from X-rays, neutron radiation and the high voltages needed to bring about fusion. WIRED should add: don't try this at home, unless you really know what you're doing. And get professional and legal guidance about all risks.