

==DEMOS==

Plasma is the fourth state of matter - it is a charged gas. In a gas the particles have quite a lot of energy and move around fast. Now if you give the atoms even more energy, for example by heating or applying a voltage, then the electrons have enough energy to escape from the atom. The electrons are stripped away from the atomic nucleus so that electrons and nuclei are moving around separately. The gas is now charged. It is a plasma. And a plasma can conduct electricity because the electrons – the charge carriers – can move.

You need: A plasma ball and a fluorescent tube light.

What to do: Turn on the plasma ball and touch it gently with your fingers, moving them around. Take the fluorescent tube at one end and touch the other end to the plasma ball, or hold it just a small distance away.

What happens?

A plasma ball shows visually the plasma conducting electricity. The glass ball contains gas at low pressure, which makes it easier to ionise, or strip the electrons. A high voltage applied at the centre of the ball drives current to flow between the centre and the glass, and the path is shown by the coloured streamers. But the current does not flow through the glass, and this causes charge to build up at the glass surface, which generates an electric field. The electric field (along with the electric field generated at the centre of the ball) will induce current in nearby conductors, like the fluorescent tube in the picture.

