

Inertial confinement fusion

The US government's National Ignition Facility in California in August came the closest yet to achieving net energy from a fusion reaction using lasers. NIF's inertial confinement system consists of:

A gold cavity with openings at either end called a **hohlraum**

A **fuel capsule** at the hohlraum's centre

A layer of **deuterium-tritium fuel** within the capsule

How it works

Lasers

Plasma

1

Laser beams, up to 192, are fired into the hohlraum, heating it and creating a superhot plasma, a gas stripped of electrons

2

X-rays from the effect of the lasers on the hohlraum blow off the surface of the capsule

3

In the reaction the fuel layer implodes creating the conditions for fusion to occur. If the heat spreads rapidly enough through the fuel, the energy yield can outpace input. This is known as ignition

Graphic: Ian Bott

Sources: Lawrence Livermore National Laboratory; US Department of Energy; FT research

© FT

