Blazing core closes gap on bubble fusion

Justin Mullins. **New Scientist**. London: Mar 5-Mar 11, 2005. Vol. 185, Iss. 2489; pg. 17, 1 pgs

Abstract (Summary)
The idea that nuclear fusion can occur inside bubbles created by bombarding fluids with sound waves has received a boost. Temperatures inside such bubbles are far higher than previously thought, brining them closer to the conditions required for fusion. At the heart of "bubble fusion" is something called sonoluminescence: blast a fluid with powerful sound waves and one can cause bubbles to appear and then collapse in a blaze of light.

Full Text (313 words)

THE idea that nuclear fusion can occur inside bubbles created by bombarding fluids with sound waves has received a boost. Temperatures inside such bubbles are far higher than previously thought, bringing them closer to the conditions required for fusion.

At the heart of "bubble fusion" is something called sonoluminescence: blast a fluid with powerful sound waves and you can cause bubbles to appear and then collapse in a blaze of light (NewScientist, 22 January, p 38). In 2002, a group of physicists at Oak Ridge National Laboratory in Tennessee controversially claimed to have found the first evidence of fusion taking place inside these bubbles.

Critics said the light produced by these bubbles indicated the temperature inside was only 10,000 kelvin, nowhere near the 10 million kelvin required for fusion. But it turns out that these light measurements tell only half the story. "When you measure the temperature of the sun you find it is 7000 kelvin because you only see its cool outer surface. The core is opaque," says Larry Crum, an expert on sonoluminescence at the University of Washington in Seattle. Similarly, light from bubbles might only be revealing their surface temperature.

Now David Flannigan and Ken Suslick at the University of Illinois at Urbana-Champaign have detected signs of much higher temperatures deep inside collapsing bubbles. The bubbles were created in a beaker of sulphuric acid and produced the most intense sonoluminescence ever recorded. This allowed the scientists to analyse the spectrum of light from the core of the bubbles for the first time. They say the light carries the characteristic signature of exotic ions such as positively charged oxygen that can form only in a plasma at temperatures of around 200,000 kelvin (Nature, vol 434, p 52).

Crum believes that, like the sun, the bubbles may hide even higher temperatures. "So maybe [bubble] fusion is technically possible," he says. Justin Mullins

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