Hoi Polloi 5 hours ago

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The situation is very different with the American laser fusion. There, with a stadium full of enormous lasers that are all aimed at one focal point, a lot of laser energy is beamed into a die with fusion fuel in a nanosecond. That die in the focal point immediately evaporates in the gigantic heat, but if everything goes well, that fusion fuel will receive such a blow that a little bit of nuclear fusion with associated energy production will briefly occur. End experiment.

Charging in a millisecond is not possible

After that, the lasers have to charge for a long time before another mega flash, and a new die has to be placed in the focus. The fact that more fusion energy may have been released than was consumed in laser energy is really just an administrative detail here. Because in theory you can generate electricity with that fusion energy, but this does nothing to maintain the process. That is essentially not self-sustaining.

In the experiment in the NIF, the net energy yield was approximately one million joules. Is that much? A little nuclear power plant produces a gigawatt of electricity, or a billion joules per second. So you would have to zap away at least a thousand of those dice per second with those huge lasers to match that. That is not possible with just one such stadium full of lasers, because they cannot charge themselves in a millisecond. Not even in a second, by the way, so it is clearly impossible to scale up laser fusion to a usable size in this way.

Very expensive stillborn child

So all the euphoria about passing this break-even point on December 5 is hype. The Americans have not come one step closer to electricity from nuclear fusion.

There is also room for skepticism about fusion reactors such as ITER. There, too, huge hurdles have to be taken before such a reactor can really produce power for the grid. Personally, I estimate that ITER will be a very expensive stillborn child. But ITER and its planned successor at least still use a fusion process and reactor concept that can work in principle.

In the case of American laser fusion, there is not even a concept for a continuous fusion process or a reactor in which this could take place. The real reason to keep pumping billions

into that National Ignition Facility was and is that such a gigantic laser flash actually detonates a tiny hydrogen bomb. So you can study nuclear explosions in the lab. But you create support for financing with peaceful utopias, they know in Washington.