



Posted by u/SynopticOutlander 4 years ago

Will ITER work?

I'd like to hear your opinions on the proposed 500MW output to 50MW input, with a 1000sec sustained reaction. How sure are we? Is all the math there? If so, why aren't we more excited? As the facility is slated to be operational in only 2019. If ITER succeeds will that put an end to Stellarators?

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UWwolfman 2 points · 4 years ago · *edited 4 years ago*



As a fusion scientist my goals for ITER are slightly different then the political objective of $Q=10$ (500MW) for 500s. It is absolutely critical the ITER achieves high Q for a long sustained pulse. But ITER is really a science experiment that is needed to study the physics of a self-heated burning plasma. The knowledge we gain from such experiments is critical. I will consider ITER a success if it achieves a slight lower Q for shorter pulse lengths as long as it allows us to study this physics.

ITER is designed using theoretical and empirical models that are based off of decades of experience. There is reasonable confidence that it will work. However, ITER is a extrapolation of these models to a parameter regime that has never been explored. As such, there is no guarantee that it will work. This is the nature of science. We are constantly building experiments to study new frontiers where there are gaps in knowledge. If we knew with 100% certainly what would happen, then there would be little point in building the experiment.

For ITER one area of particular uncertainty deals with material degradation of the plasma facing components. The thermal



Finally, the tokamak and stellarator are two complimentary paths two developing fusion. Knowledge gained on one experiment helps the other. And there is no guarantee that one of these two concepts is the optimal confinement concept. Fusion research benefits from exploring a multitude of confinement concepts.

↑ **SynopticOutlander** 1 point · 4 years ago

↓ My understanding is that the Stellarators design is an attempt at better Containment of super heated particles. How are these particles managing to escape such strong magnetic fields? I know that particles must be heated to around 100million C(?) in order to fuse, but what types of temperatures are actually reaching the interior walls?

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Posted by u/sammyjamez 2 days ago

Why do scientists often struggle when it comes to spreading awareness effectively? What can be done in order to make awareness more impactful and effective?

Before I start the post

So this is more of a personal opinion rather than an objective one so please take it with a pinch of salt.

I also would like to point out that I am going to be writing this post mostly from the perspective of mental health awareness as it is the type of awareness that I am familiar with the most.

I know that spreading awareness of an overly-complicated issue and trying to boil it down using simple language and years of knowledge to be ingested in minutes for every demographic to understand is not an easy task.

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