



Research institutes: Max Planck Institute for Plasma Physics (Garching, Germany)
Commissariat d' Energie Atomique (Saclay, France)

Can we replicate stellar nucleosynthesis?

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Abstract

It is argued that the genuine stellar nucleosynthesis (p. 5) cannot be replicated with the artificial conditions in stellarator-type fusion (Wendelstein 7-X in Germany) or tokamak fusion (ITER in France). We need [quantum gravity](#) to understand how quantum tunneling works in the presence of gravity, and then model quantum tunneling in plasma under strong gravity.

Let me begin with the stellarator-type fusion pursued in [Wendelstein 7-X](#) in Germany.

Wendelstein 7-X and fusion. December 7, 2012, pp. 14-15
https://www.ipp.mpg.de/987655/w7x_and_industry_en.pdf

The plasma must be held at a temperature of 100 million degrees. Ring-shaped, twisted magnetic fields confine the plasma and thermally isolate it from the cold vessel walls.

The true art now lies in finding the "correct" magnetic field. In stellarator-type fusion devices like Wendelstein 7-X, the magnetic field is determined exclusively by the geometry of the outer magnetic coils. The complex geometry of the Wendelstein 7-X coils is the result of ten years of systematic calculations using the supercomputers available in the late 80's and 90's. Because the shape of the coils is determined by the physics and calculated using strict optimisation procedures, they can be regarded as ideal.

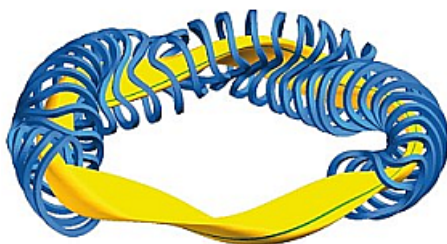
[Wendelstein 7-X](#) is a joke. People there dream to achieve "up to approximately 30 minutes of continuous plasma discharge in 2021." So far [well over €1 billion](#) – all taxpayers' money – have been invested in it, as some "potential of stellarators as power plants".

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No, [Wendelstein 7-X](#) won't work. **No way.** I emailed the chief scientist (Thomas Klinger) twice, but he didn't even confirm the receipt of my messages. Read p. 30 in

<http://www.god-does-not-play-dice.net/zenon.pdf>

I will not delve into any details here. Read p. 30 above and follow the links therein. Sir Arthur Eddington explained the puzzle in [The Internal Constitution of the Stars](#), published in October 1920 (p. 298): "A star is drawing on some vast reservoir of energy by means unknown to us." Can we reproduce something *totally unknown* to us with the so-called [stellarator](#), invented by Lyman Spitzer in 1951? It is the core idea of Wendelstein 7-X – read the excerpt [above](#).



For comparison, suppose people at Max Planck Institute for Plasma Physics (Garching, Germany) and the Commissariat d' Energie Atomique (Saclay, France) decide to build a [mechanical model of a centipede](#) below, to reproduce its wave-like locomotion (link [here](#)).



Fig. A

Robot that can mimics Centipedes Locomotion



Fig. B

Centipede ([Chilopoda](#)) Locomotion

What is missing in Fig. A, to reproduce Fig. B? The **matrix**: read the second paragraph in p. 30 at the link [above](#), and the creation of identical protons, Slide 10 in [Quantum Spacetime](#).

In the case of [Wendelstein 7-X](#), people claim that "the true art now lies in finding the "correct" magnetic field." **No way.** Forget it. More from Sir Arthur Eddington [above](#).

D. Chakalov

July 29, 2019, 14:00 GMT

Questions and Answers

Q1: What's the problem with [Wendelstein 7-X](#), in your opinion?

A1. Let me give an example, to make sure we're on the same page. Suppose you wish to cook cabbage in a pressure cooker (Fig. C), which is "trapping the steam produced from the boiling liquid inside" ([Wikipedia](#)). You also need energy to raise the temperature of the water inside the pressure cooker, which **traps** the cabbage inside. Point is, the cabbage does not produce heat, and does not depend on the cooker, nor the other way around (see [GSN](#) at p. 5 [below](#)).

Now replace the cabbage with plasma at "about 100,000,000 K" ([Encyclopedia Britannica](#)), and the pressure cooker with those "ring-shaped, twisted magnetic fields" [above](#), pictured in Fig. D. This is Lyman Spitzer's [stellarator](#) from 1951 (read [above](#)).



Fig. C

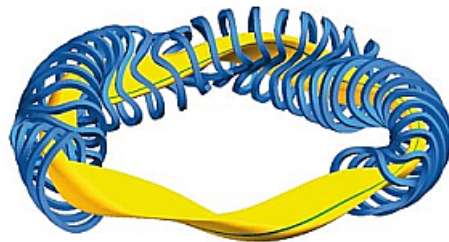
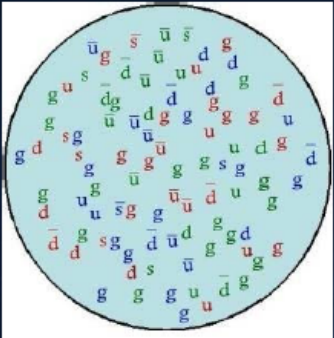


Fig. D

It may look "intuitively clear" that the idea in Fig. D will work, correct? **False**. Why not?

Because Nature employs 'something else' — the **matrix** — which is only present in Fig. B [above](#). To explain the **matrix**, consider, for example, the creation of identical protons, Slide 10 in [Quantum Spacetime](#) below. This is how Nature works. Read Sir Arthur [above](#).

Atemporal Quantum Reality: Proton's Mass



How about spin-2 Higgs-like boson at 14 TeV?

Only about 1% of proton's mass can be traced to **quarks** (two up quarks and one down quark), whereas 99% of its mass belongs to Quantum Chromodynamics (QCD) binding energy. Imagine zillions of quarks (u,d,s), antiquarks (u,d,s with a bar on top), and gluons (g) zipping around near the speed of light, banging into each other, and appearing and disappearing from QCD vacuum (Strassler 2010): they are able to assemble proton's **mass** of 938 MeV/c² with error margin of just *one* part in 10⁴⁵ (Dolgov 2012), for at least 10²⁹ years.

What phenomenon could create 10⁸² **identical** protons?

"Something unknown is doing we don't know what — that is what our theory amounts to."
 Sir Arthur Eddington, p. 27 in [zenon.pdf](#)

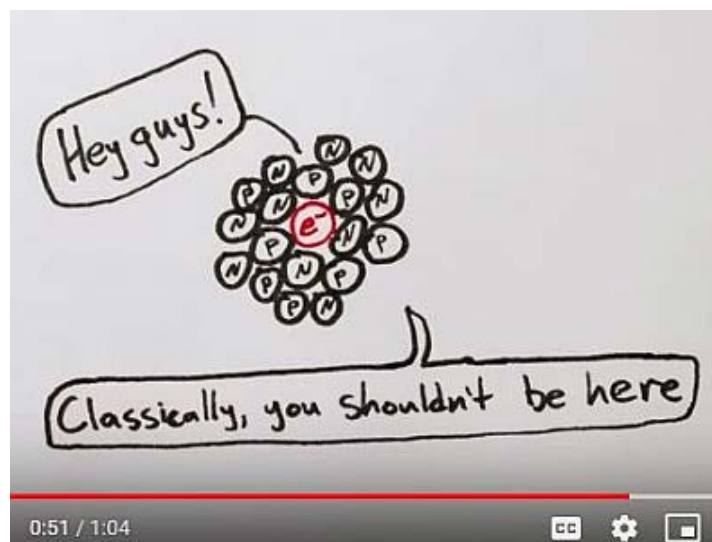
People deeply believe they know how the Sun fuses 620 million metric tons of hydrogen each second ([Wikipedia](#)), yet still cannot reproduce it. As Ian Chapman acknowledged ([June 8, 2016](#)), nuclear fusion has always been “30 years away”. Is it like the wave-like locomotion [above](#)?



The first off puzzle in Sun's engine is [quantum tunneling](#) in the presence of gravity.



How the Sun works: Fusion and Quantum Tunneling



What is [Quantum Tunneling](#)?

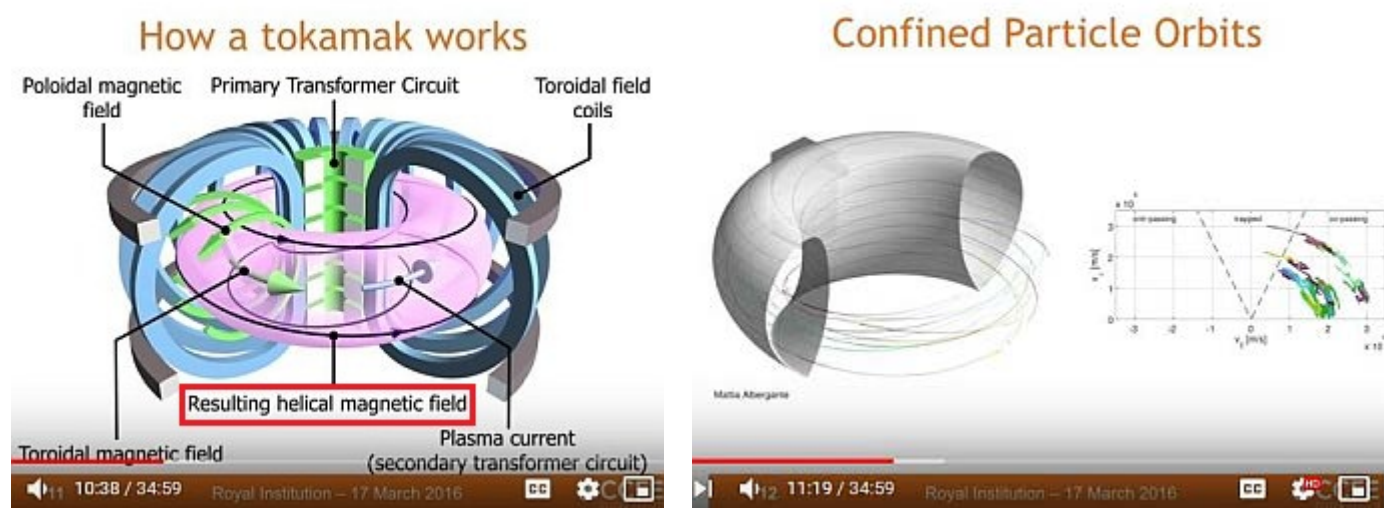
Recall that [QM textbooks](#) do *not* describe quantum tunneling as some real phenomenon, like the pressure cooker (Fig. C [above](#)). It is a genuine quantum beast that has no classical counterpart. I believe it has biological counterpart (Fig. B), dubbed **matrix** (read [above](#)).

Moreover, we will need [quantum gravity](#) to eventually understand how quantum tunneling works in the presence of gravity, and then model quantum tunneling in [plasma](#) under strong gravity. However, we don't know the origin of gravity and inertia in the first place (p. 26 in [zenon.pdf](#)), nor the origin of 'the quantum state': read Erwin Schrödinger at p. 2 in [The Physics of Life](#).

So, what will *you* do? You bluntly ignore the warning by Sir Arthur Eddington (read [above](#)) and invest **billions** of euros – **all taxpayers' money** – for your Barbie, such as [ITER in France](#) and [Wendelstein 7-X](#) in Germany. My project is much cheaper (p. 28 in [zenon.pdf](#)).

Let me be a bit more specific. Look at the "resulting helical magnetic field" yielding "confined particle orbits" below, from Ian Chapman.

Do you smell rat? Where is the crucial [quantum tunneling](#)? Where is the **matrix** (read [above](#))?



Fusion: How to Put the Sun in a Magnetic Bottle - with Ian Chapman ([June 8, 2016](#))

No, you cannot put the Sun in a "magnetic bottle" without [quantum tunneling](#). Sir Arthur Eddington suggested the mechanism of nuclear fusion in stars in 1920 ([Wikipedia](#)), and Friedrich Hund discovered the [quantum tunneling](#) in 1926. And "nucleons are quantum objects", so "the inclusion of quantum mechanics is therefore necessary for proper calculations" ([Wikipedia](#)).

In 21st century, it is truly astonishing to read that the current "experts" in nuclear fusion treat [atoms](#) as cannonballs which, if squeezed "close enough" ([Wikipedia](#)) by [gravity](#), will somehow acquire [quantum tunneling](#). This is a blazing *non sequitur*. Or sheer parapsychology. Or both.

NB: The Genuine Stellar Nucleosynthesis (GSN) by Mother Nature *cannot* be replicated with the artificial conditions in Wendelstein 7-X (p. 1) and ITER (p. 3). The former is inherently different from the latter. It is *not* some [spherical cow](#) approximation. If we compare GSN to the analogy with cabbage in pressure cooker (Q1 at p. 2), the cabbage (plasma) will heat itself *by* creating the pressure cooker ([gravity](#) & [quantum magnetic fields](#)), until they reach dynamic equilibrium. This is not a nuclear bomb.

People calculate, after [Hans Bethe](#), that "every second the sun produces the same energy as about a trillion 1 megaton bombs" ([Boston Globe](#)). So what? The task is to *mimic* (Sic!) stellar

nucleosynthesis ([Wikipedia](#)) in Sun's core. How? By heating the [plasma](#) "to about 100,000,000 K for fusion reactions to take place" ([Encyclopedia Britannica](#))? Because that's all you can suggest. You *cannot* use gravity (read [above](#)) nor any quantum phenomenon, such as [quantum tunneling](#). You have money – billions of euros, *our* money from *our* taxes – and your [advertising machine](#).

Get real. Do your homework first – read [above](#). What is holding proton's constituents together ([Slide 10](#))? What is holding centipede's legs together ([Fig. B](#))? What is holding the Sun plasma, made up by hydrogen and helium ions and their delocalized electron cloud, [together](#)? You don't need this phenomenon to make nukes and kill people. We urgently need it to save our planet – read p. 28 in [zenon.pdf](#).

July 31, 2019

Last update: August 2, 2019, 14:45 GMT

Subject: Get real.

Date: Tue, 30 Jul 2019 13:31:10 +0100

Message-ID: <CAM7Ekx=f3t12eWCncioQ5f2uaqExDxpsVR-YaWTj5FUr16BC5Q@mail.gmail.com>

From: Dimi Chakalov <dchakalov@gmail.com>

To: ian.chapman@ukaea.uk, nick.holloway@ukaea.uk, d.gann@imperial.ac.uk

<https://www.gov.uk/government/news/the-chancellor-sees-a-bright-future-for-fusion-energy>

Dear Dr Chapman,

Check out

http://www.god-does-not-play-dice.net/Wendelstein_7-X.pdf

I mentioned your name there.

Get real.

Dimi Chakalov

chakalov.net

Subject: Re: Get real.

Date: Thu, 1 Aug 2019 12:38:39 +0100

Message-ID: <CAM7EkxnaiAi94ZTDE44DSGuSHV3AQhvNyW7onumLBSrW=dcr9Q@mail.gmail.com>

From: Dimi Chakalov <dchakalov@gmail.com>

To: ian.chapman@ukaea.uk, nick.holloway@ukaea.uk, d.gann@imperial.ac.uk

P.P.S. I will appreciate your confirmation of my email messages. See an excerpt ([attached](#)) from p. 5 at

http://www.god-does-not-play-dice.net/Wendelstein_7-X.pdf

D.C.

On Tue, 30 Jul 2019 13:31:10 +0100, Dimi Chakalov <dchakalov@gmail.com> wrote:

Can we save the tokamak-based ITER?

ITER, a roughly \$65 billion international project ([Paul Dabbar](#)) that was supposed to show that generating energy by fusing atoms together could be at least scientifically feasible, is also the most expensive scientific gamble ([Paul Henley](#)). It may only look very “exciting”, like [Titanic](#).

Let me try [brainstorming](#). Regarding confined [particle orbits](#): how about a *new poloidal field*, with different characteristics (phase?), to enhance the [transversal rotation](#) of the plasma donut?



See [Mattia Albergante](#) [above](#)

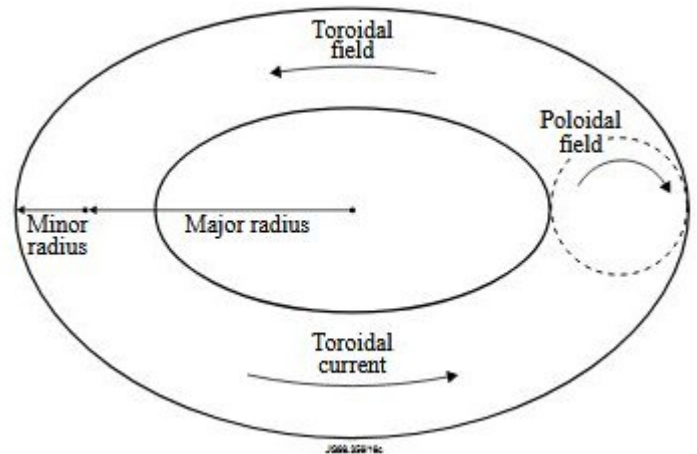


Fig. 3.1, p. 13 in [JETR99013.pdf](#) by John Wesson

How can it produce new boson-like “particles” in the plasma, which can hold it *en bloc*? Or a [standing wave](#) in the delocalized electron “cloud”, which can bootstrap the plasma *en bloc*?

I can't see how this could be done ([Jens Zamanian](#) and [Giovanni Manfredi](#)). Any ideas?

The good thing about [brainstorming](#) is that you can say anything that comes to your mind, as you are not afraid that you may (and most often will) come up with a *very stupid idea*. I suddenly recalled the [pi-bond](#) in chemistry and [phonons](#) in condensed matter physics, and ... here we are. Hope you can do better. Sorry, I'm just an engineer.

Dimi Chakalov
 August 2, 2019
 Last update: August 3, 2019, 14:40 GMT