

How big are stars?

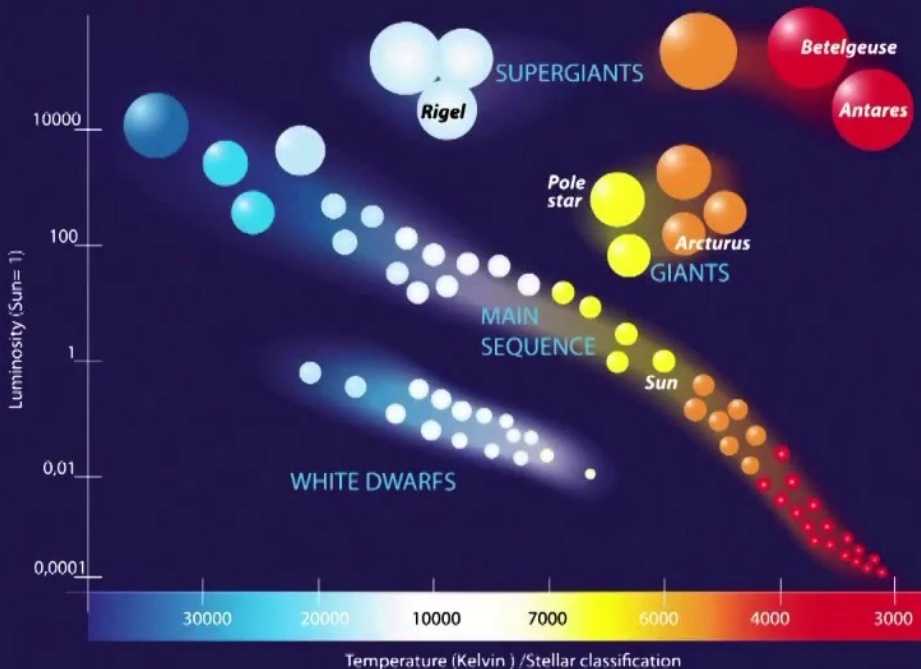
...a tale of Super Giant Stars and Shells

Dory Szécsi

University of Birmingham



Girls in STEM day
12th September 2018



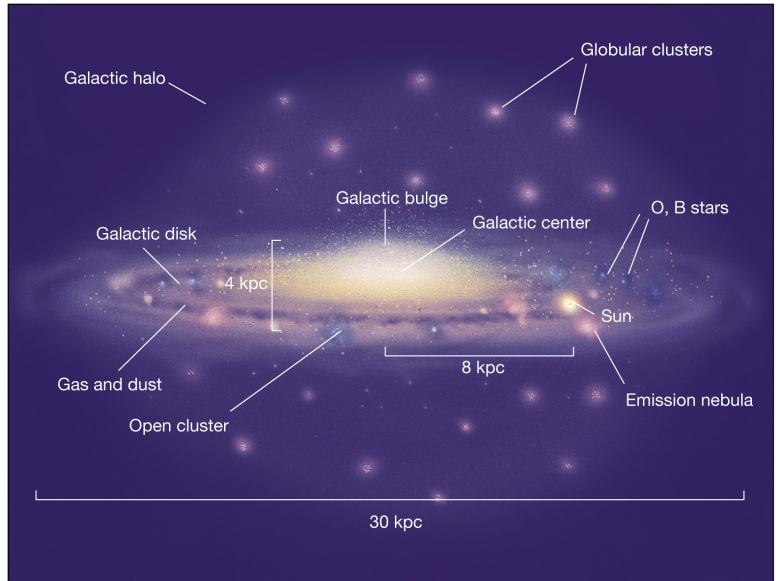
A “globular” star-cluster = a globular cluster



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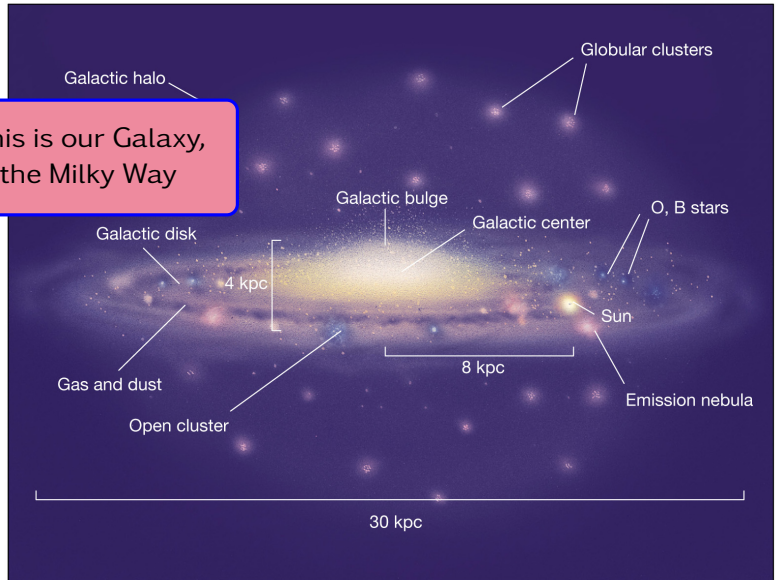


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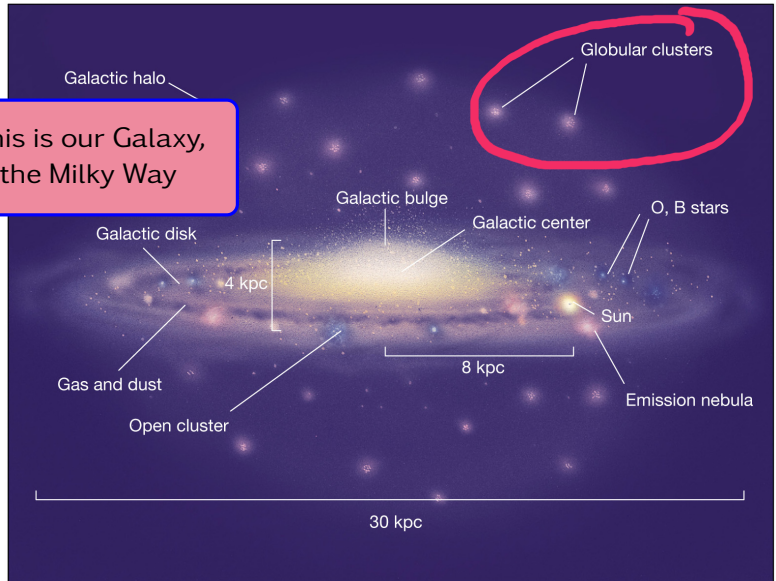
A “globular” star-cluster = a globular cluster

This is our Galaxy,
the Milky Way



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So what do we know about GCs?



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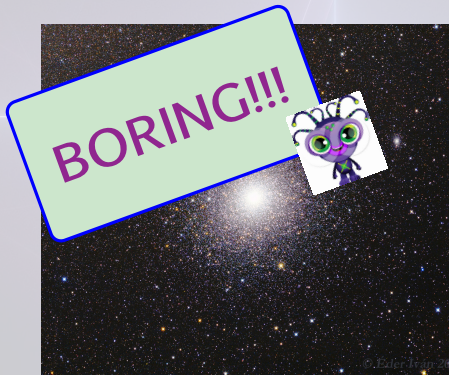
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- in the Milky Way, about 150 GCs

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- **metal-poor!**
about 50 times more metal poor than our Sun

So what do we know about GCs?



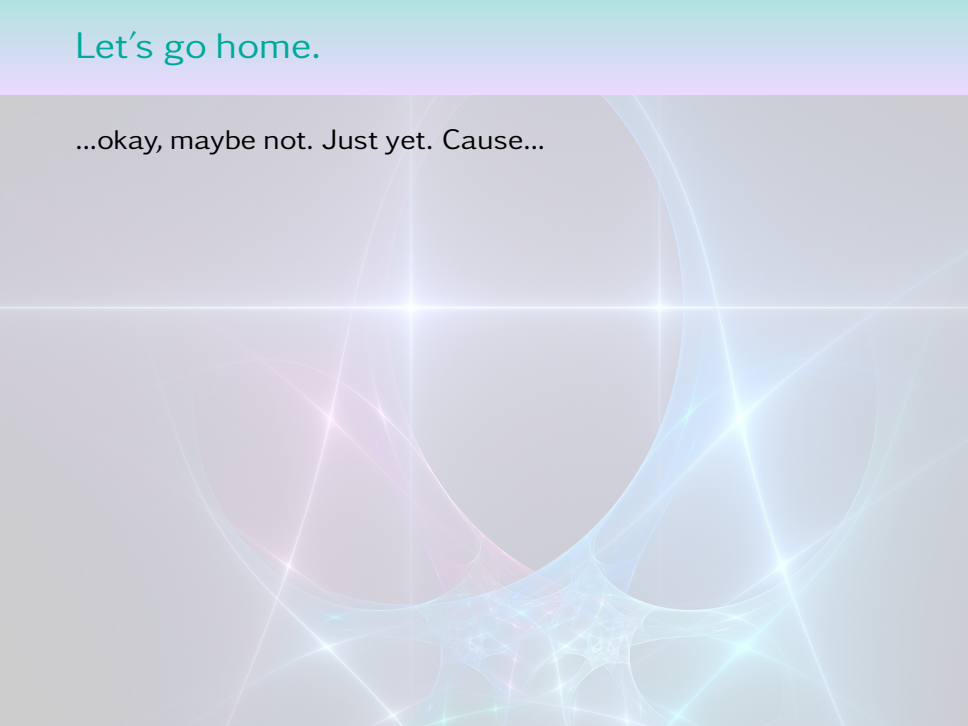
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Let's go home.



Let's go home.

...okay, maybe not. Just yet. Cause...

The background features a large, faint white circle centered in the upper half. Overlaid on this are several glowing, ethereal lines in shades of blue, purple, and pink. These lines form a complex, web-like pattern that resembles a stylized butterfly or a network of connections. The lines have a soft, luminous quality, with some points appearing as bright, multi-colored starbursts. The overall aesthetic is dreamlike and futuristic.

Let's go home.

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By taking a closer look, astronomers found...



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The periodic table of elements

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|--|--|--|--|--|---|--|--------------------------------------|---|--|---------------------------------------|--|---|---------------------------------------|--|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|--|------------------------------------|---------------------------------------|------------------------------------|
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* Lanthanide series

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A periódusos rendszer forrása: <https://commons.wikimedia.org/wiki/File%3APeriodic-table.jpg> (2015-06-30)

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high sodium (Na) + low oxygen (O)
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| 132.91 | 137.08 | 174.97 | 178.49 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 | 198.91 | 197.04 |
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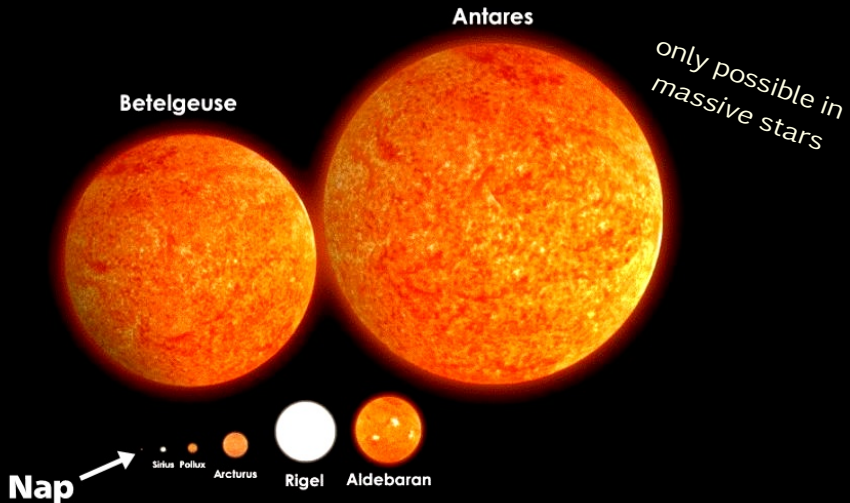


This is impossible! In Sun-like stars at least.

high sodium (Na) + low oxygen (O)
high aluminium (Al) + low magnesium (Mg)

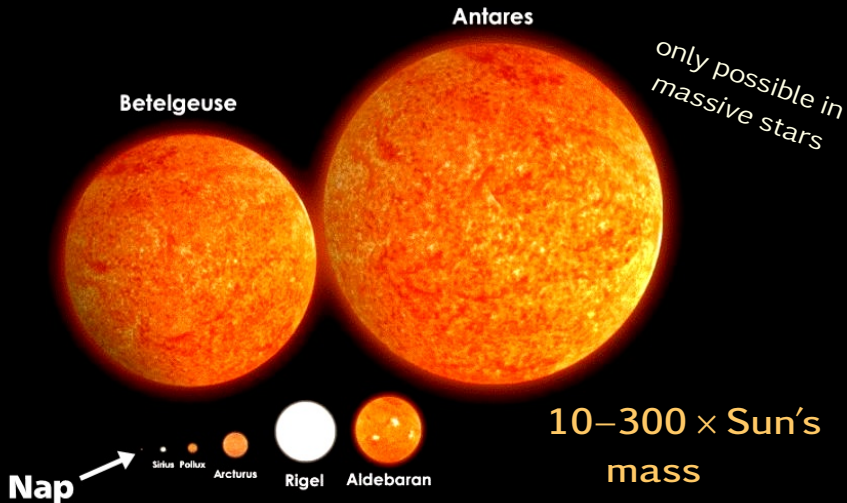
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This is impossible! In Sun-like stars at least.

This is getting exciting... ;)

Sodium (Na) + low oxygen (O)
Aluminum (Al) + low magnesium (Mg)



Antares

only possible in massive stars

Nap



Sirius



Pollux



Arcturus



Rigel



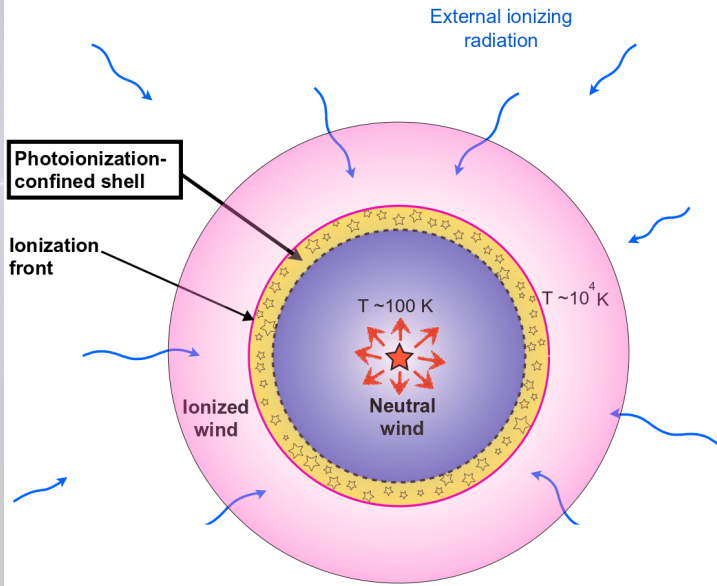
Aldebaran

10–300 × Sun's mass

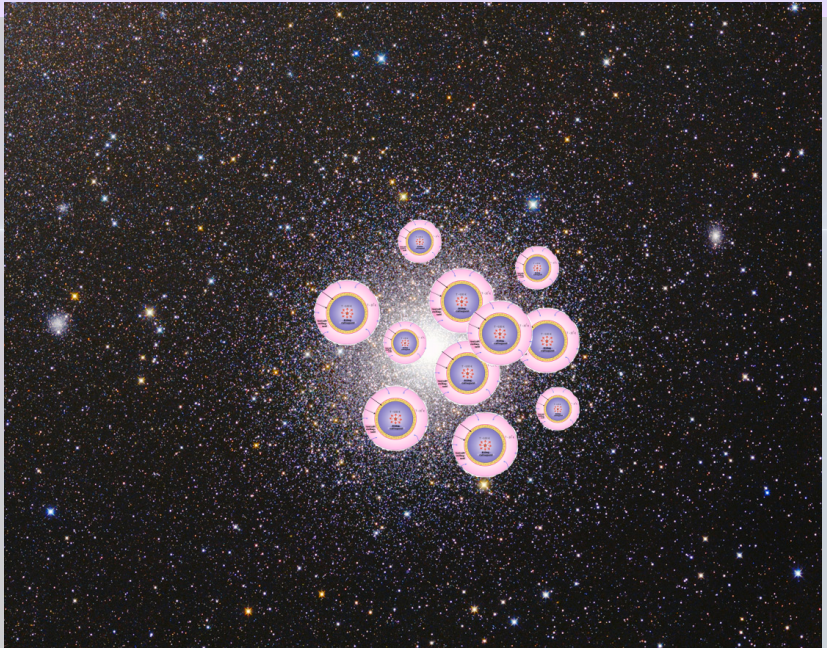
Supergiant Shells forming new stars



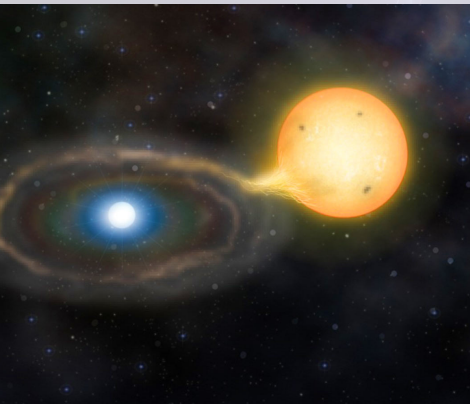
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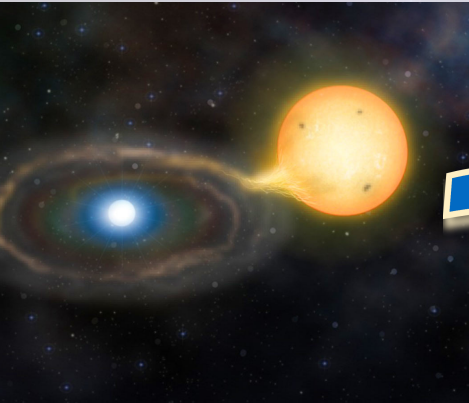
This is how GCs might have been born:



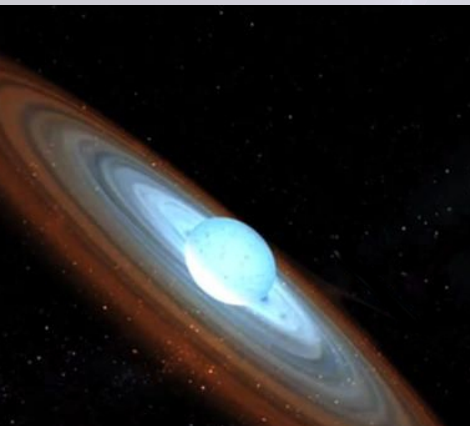
Alternative theories... 'dancing' stellar couples:



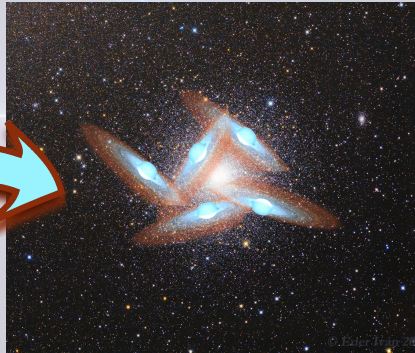
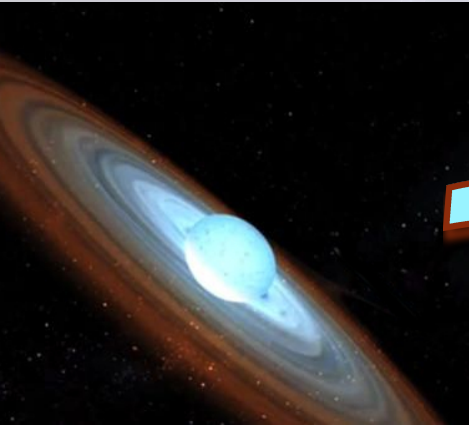
Alternative theories... 'dancing' stellar couples:



Or ... rapidly rotating stars:



Or ... rapidly rotating stars:



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Why not all at once?



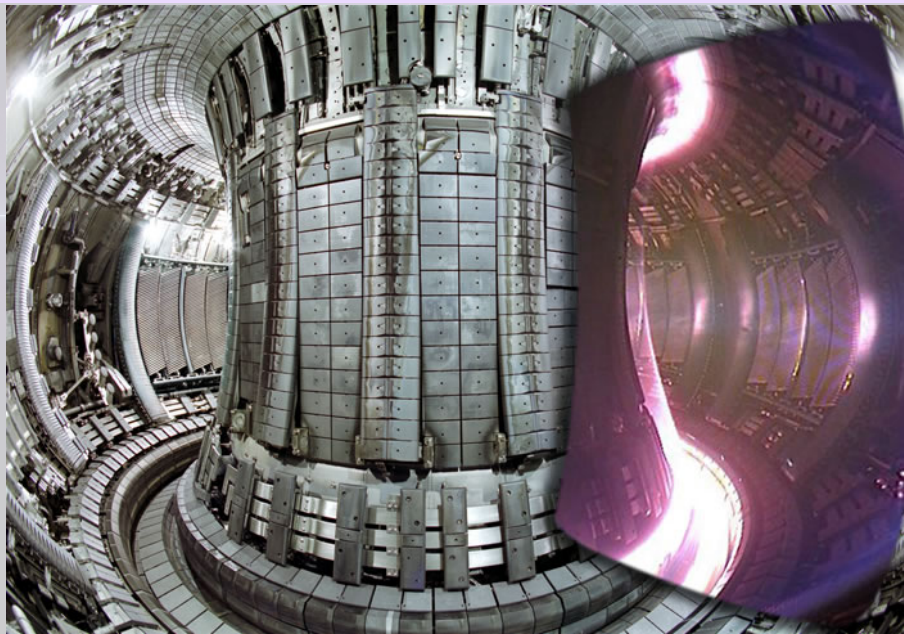
Why not all at once?



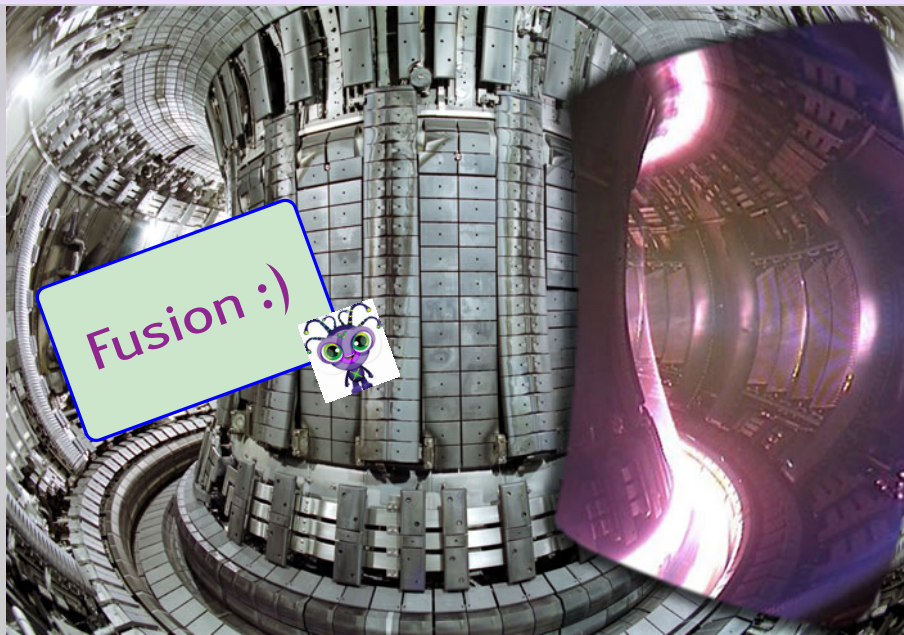
Okay, this is cool. But who cares?!



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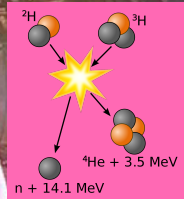


Fusion :)



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Fusion :)





That's all, folks!

