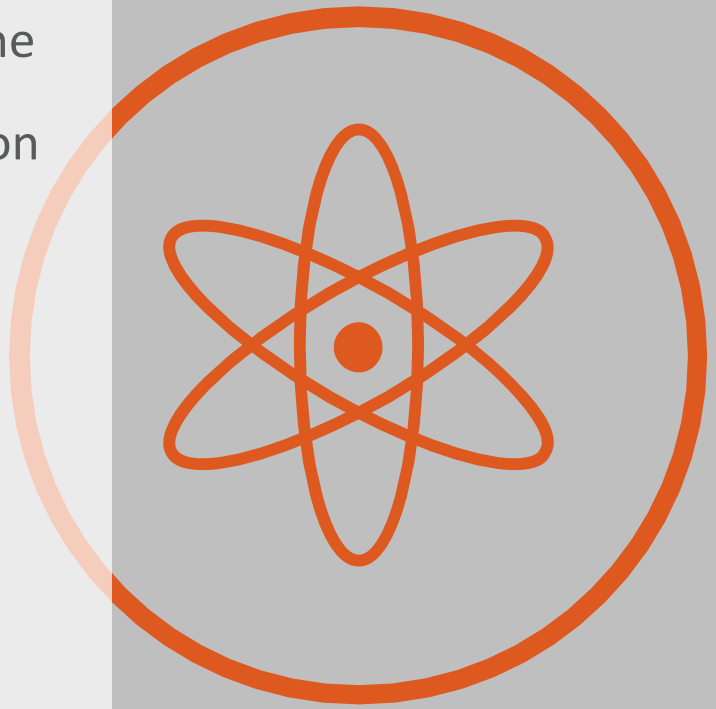
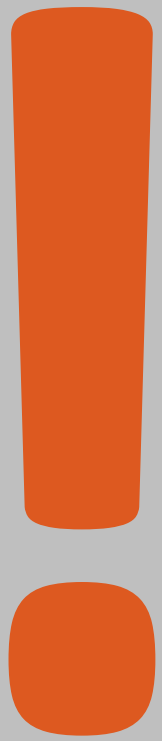
BASICS OF NUCLEAR REACTION

A general introduction to the main concepts of fusion, fusion vs. fission, solar fusion vs. fusion on Earth.

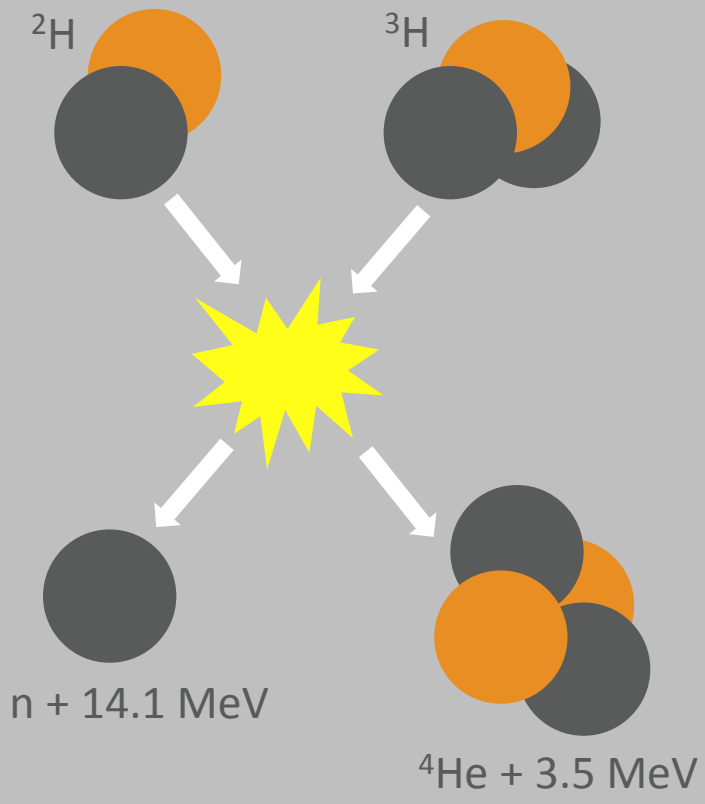




WE KNOW
THAT TWO TYPES
OF NUCLEAR
REACTIONS EXIST:
FUSION & FISSION

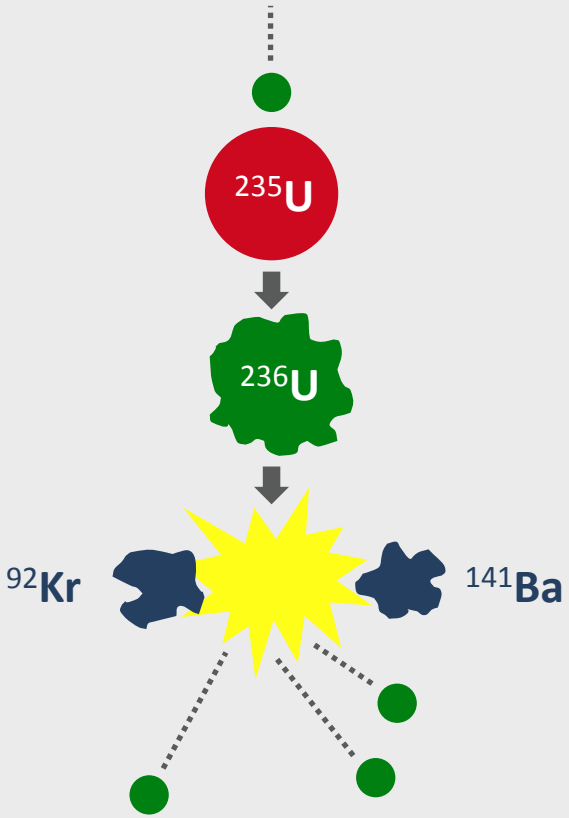
FUSION

Two small nuclei bind making a bigger one.



FISSION

One large nucleus breaks up into smaller ones.



FUSION IS AN ENERGY SOURCE

The resulting atom is lighter than the initial ones. Where has the mass gone?

It is converted into **energy**, according to the famous equation from Albert Einstein:

$$\mathbf{E=mc^2}$$

In other words:
Energy = mass x speed of light squared

FUSION WORKS

The sun and the stars shine thanks to fusion reactions taking place in their core.

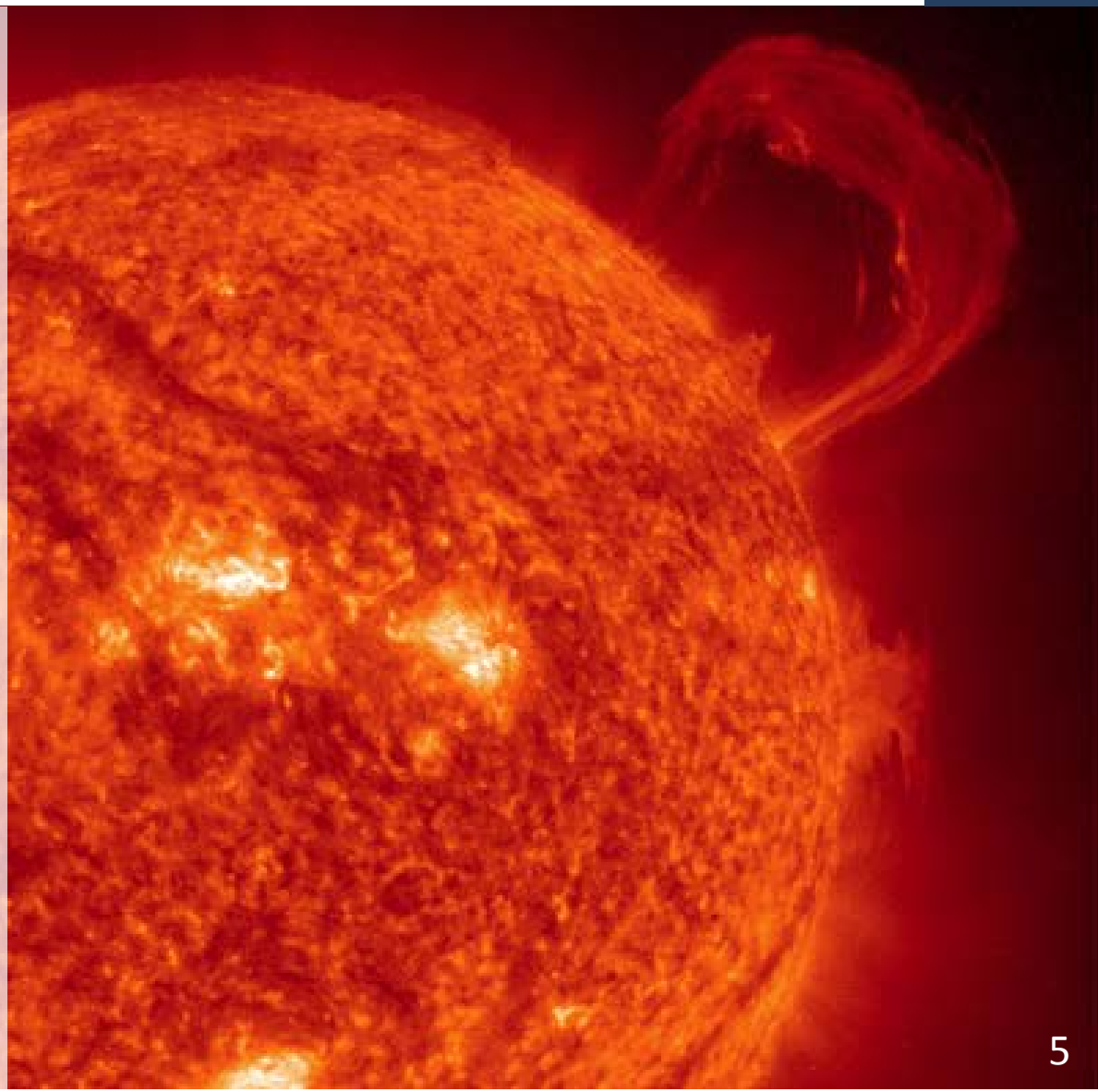


Image: NASA

HOW CAN WE DO THE SAME ON EARTH?

The Sun fuses Hydrogen (H) nuclei into Helium (He).

On Earth, the most efficient approach is to use two isotopes of Hydrogen:

- Deuterium (D)
- Tritium (T)

Proton
$^{1}_{1}H$

Deuterium
D

Tritium
T