Possibilities of using energy provided from nuclear fusion in the near future

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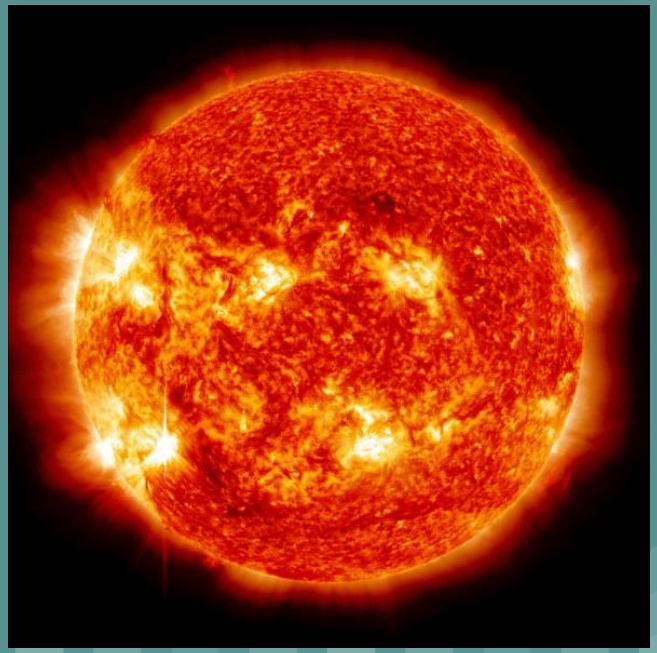
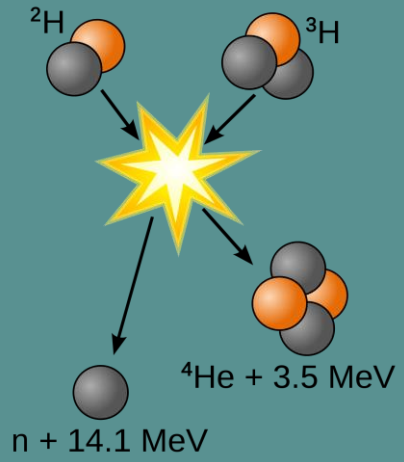
Civil Engineering
2020

Nuclear Fusion energy

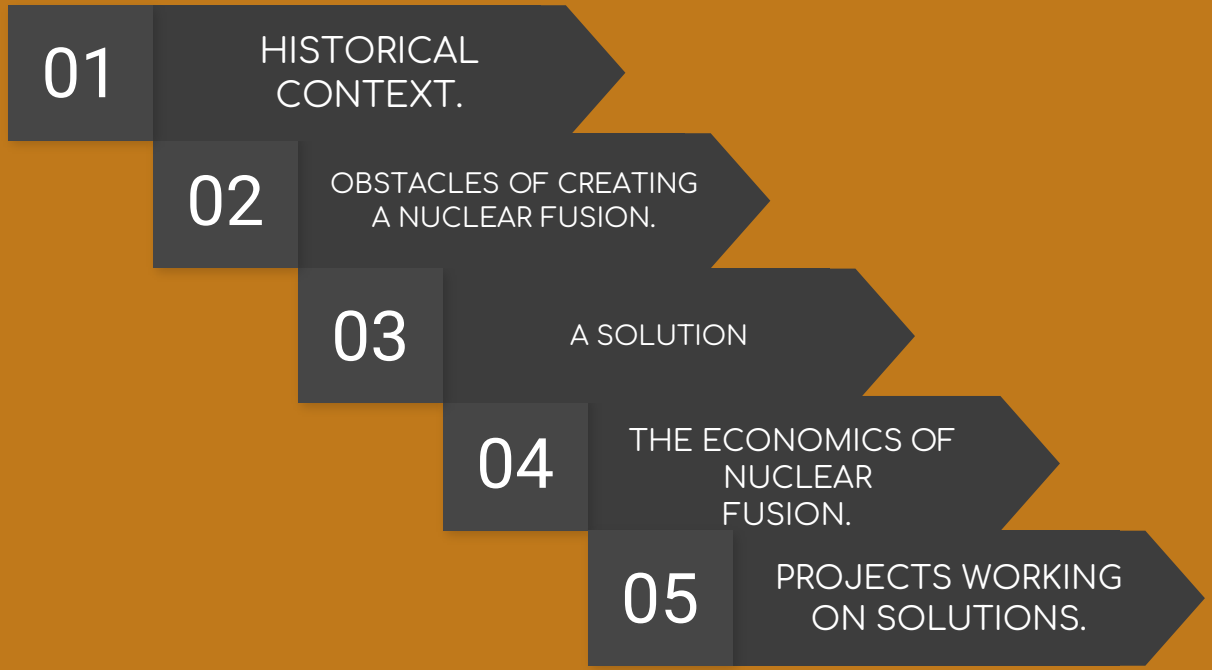
"Our own sun"





Nuclear reactor

Presentation Map



01 - Historical context

The Boston Daily Globe

BOSTON, WEDNESDAY MORNING, FEBRUARY 1, 1950

28 PAGES—FIVE CENTS

HAIL TRUMAN H-BOMB ORDER

Bishop Wright Appointed to Worcester

Military, Scientists, Politicians Praise Act

AEC Indicates Hydrogen Project Already Started

By CARL LEVIN

2 Young Girls Die as Sled, Truck Crash

Lynn Boy Victim in Similar Mishap; Mother a Witness

Heads New Diocese of the County

Msgr. Weldon of New York Named to Springfield See

Plan Aerial Guard to Protect Coast of New England

KILLED IN COASTING ACCIDENTS—Carol Ervin (left) and Lois McVey, whose sled was hit by a truck in East Boston (scene at top).

Driving Tough Today; More Snow on Way

U. S. Leaders Would Keep Base in Japan

ARTIST'S CONCEPTION of how H-bomb might work, using atomic bomb as a mere "trigger" to generate enough heat to set up the H-bomb's "thermonuclear fusion" process.

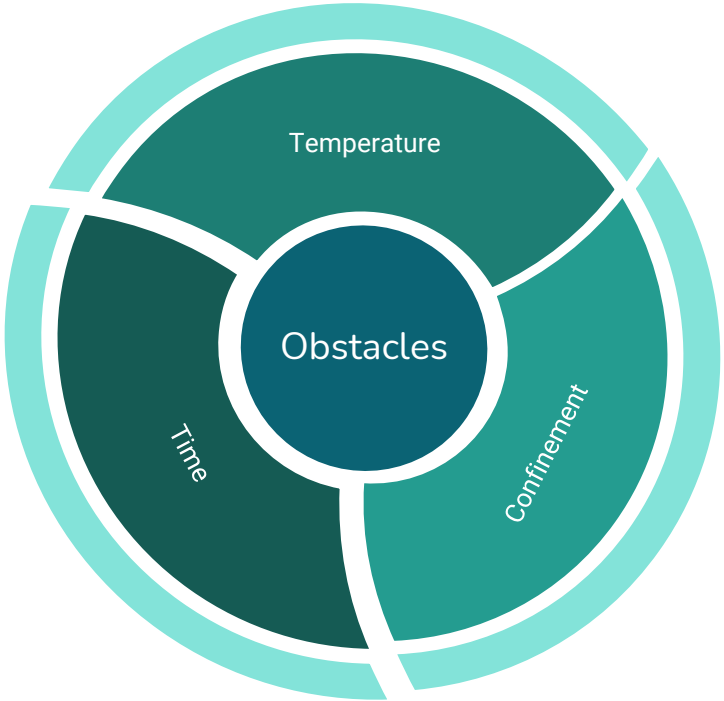
3 Brink's Employees Called in New Quiz

Court Told Fear of Cancer Drove

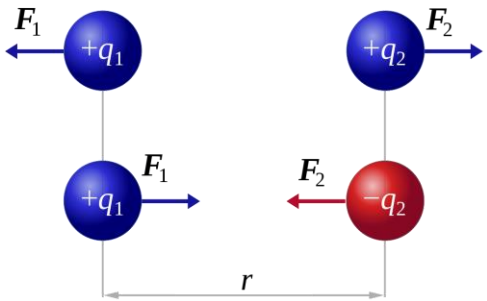
Truman Urges Soft Coal Miners Dig for 70 Days

Abashed Boston Warmer Host to Japanese

02 - Obstacles of creating a nuclear fusion



The Coulomb Force and Elastic Collisions

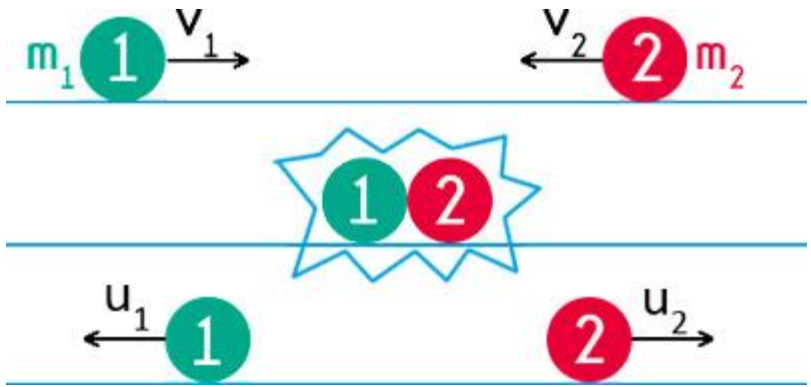


$$|F_1| = |F_2| = k_e \frac{|q_1 \times q_2|}{r^2}$$

"Ignition temperature"

"Thermonuclear fusion or Holt melt"

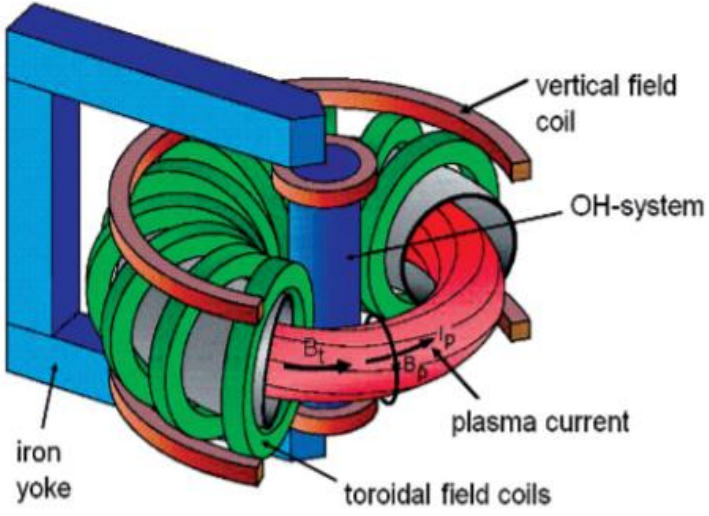
The need for an efficient confinement system



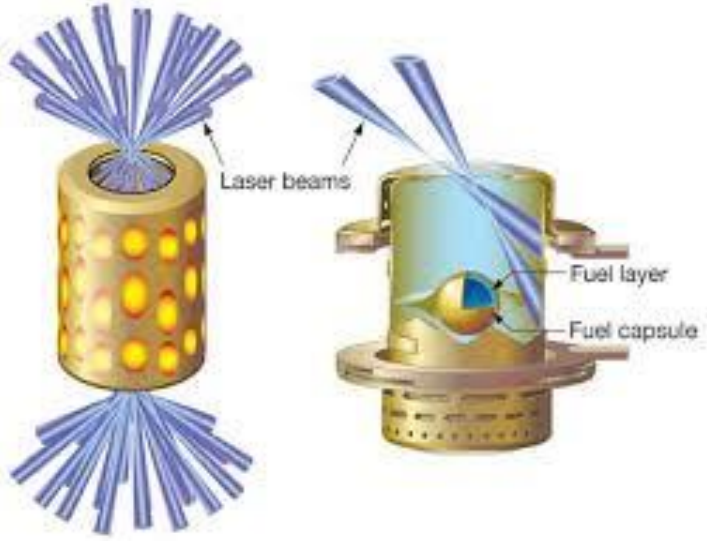
Confinement System

03 - A solution: confinement methods

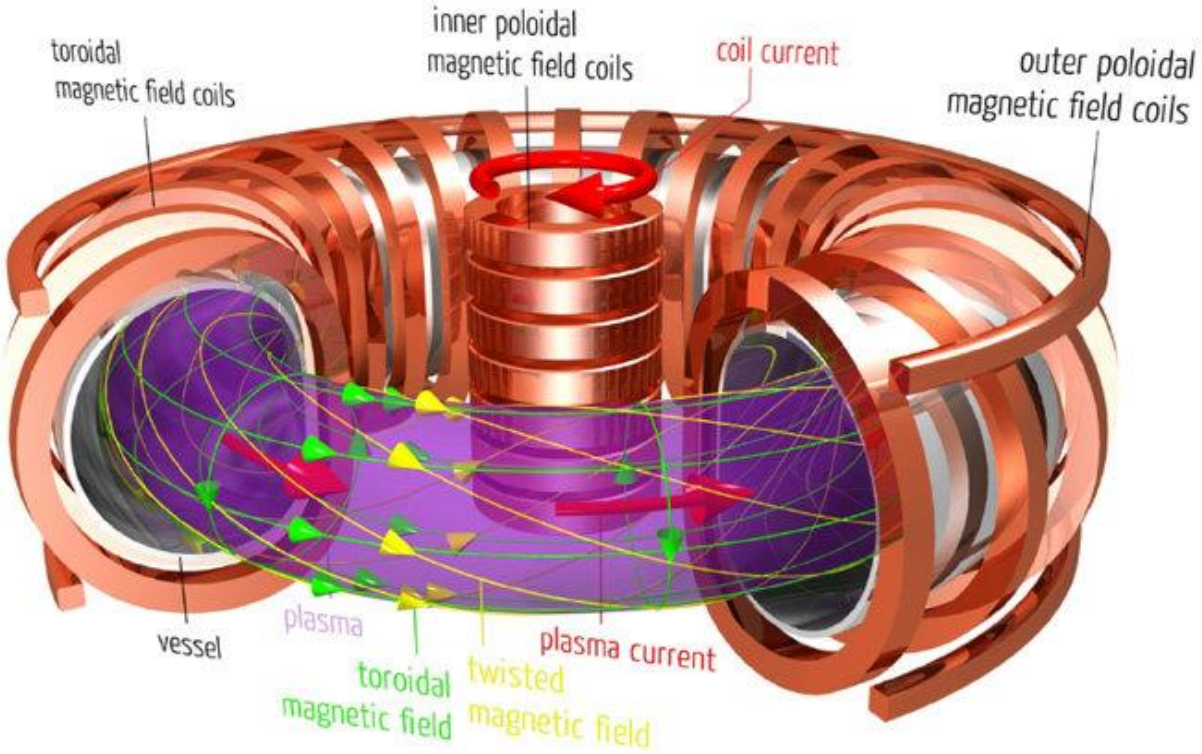
Magnetic Confinement



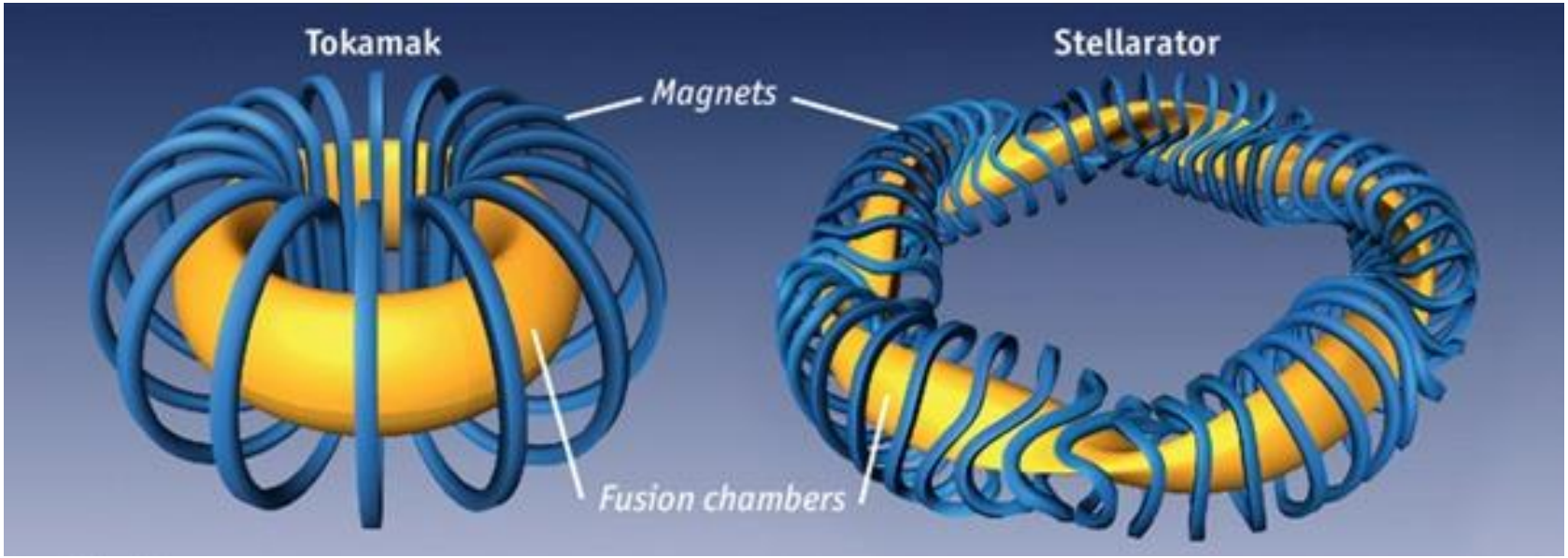
Inertial Confinement



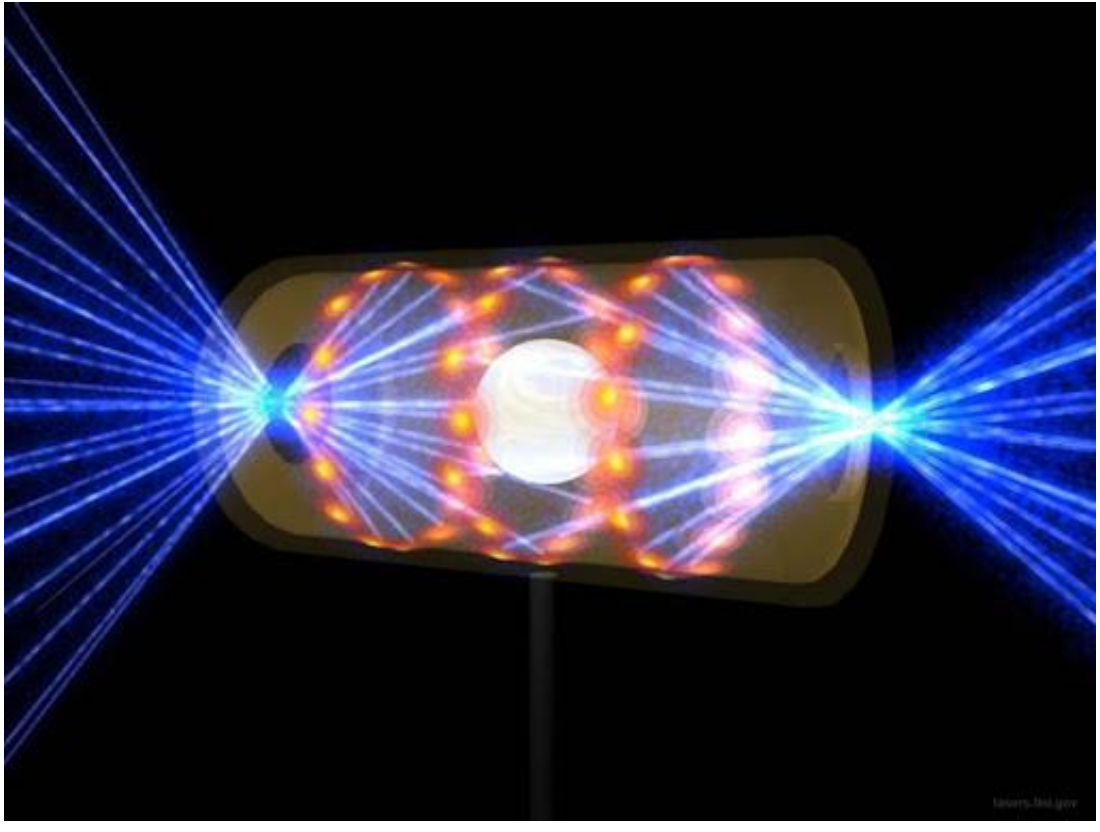
MAGNETIC CONFINEMENT



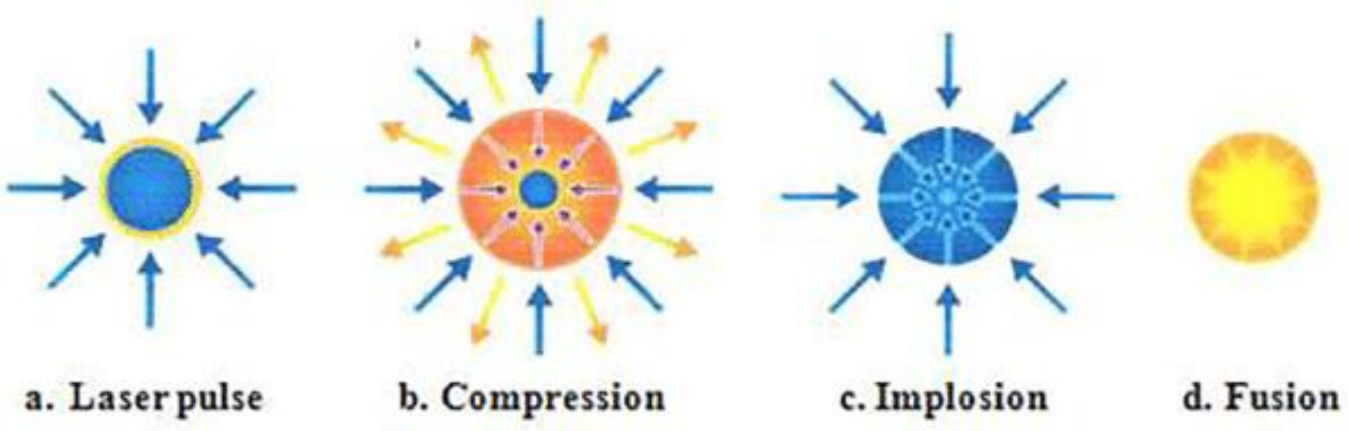
Tokamak vs Stellarator.



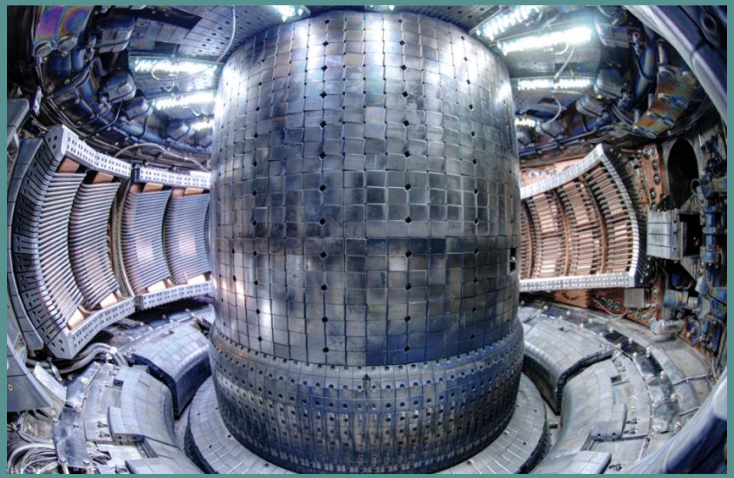
INERTIAL CONFINEMENT



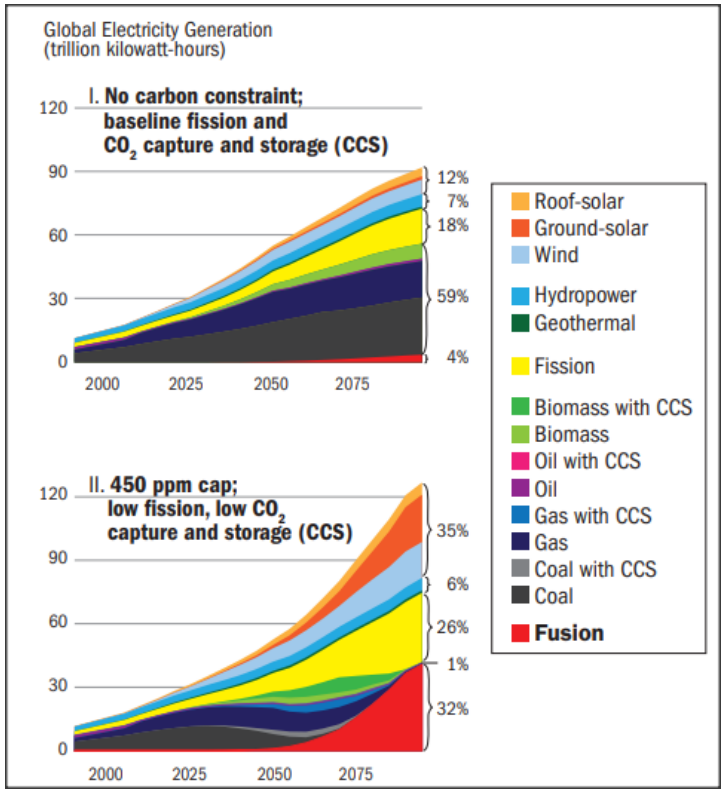
Nuclear fusion process.

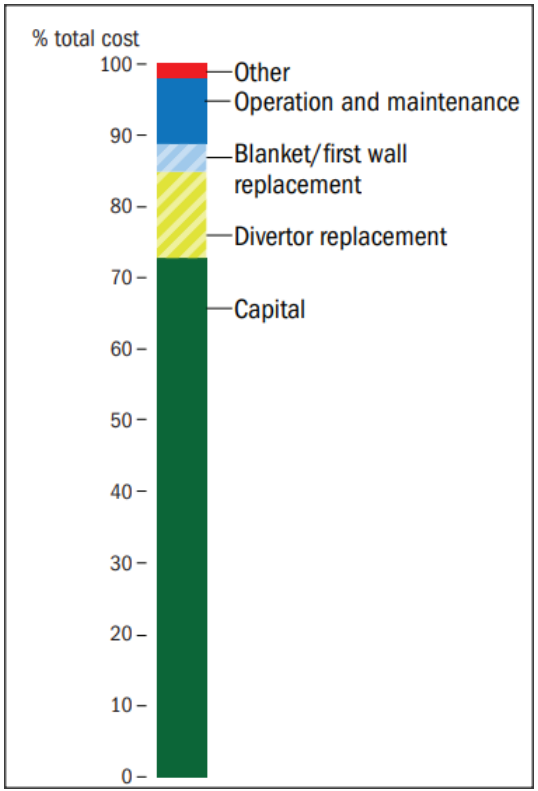


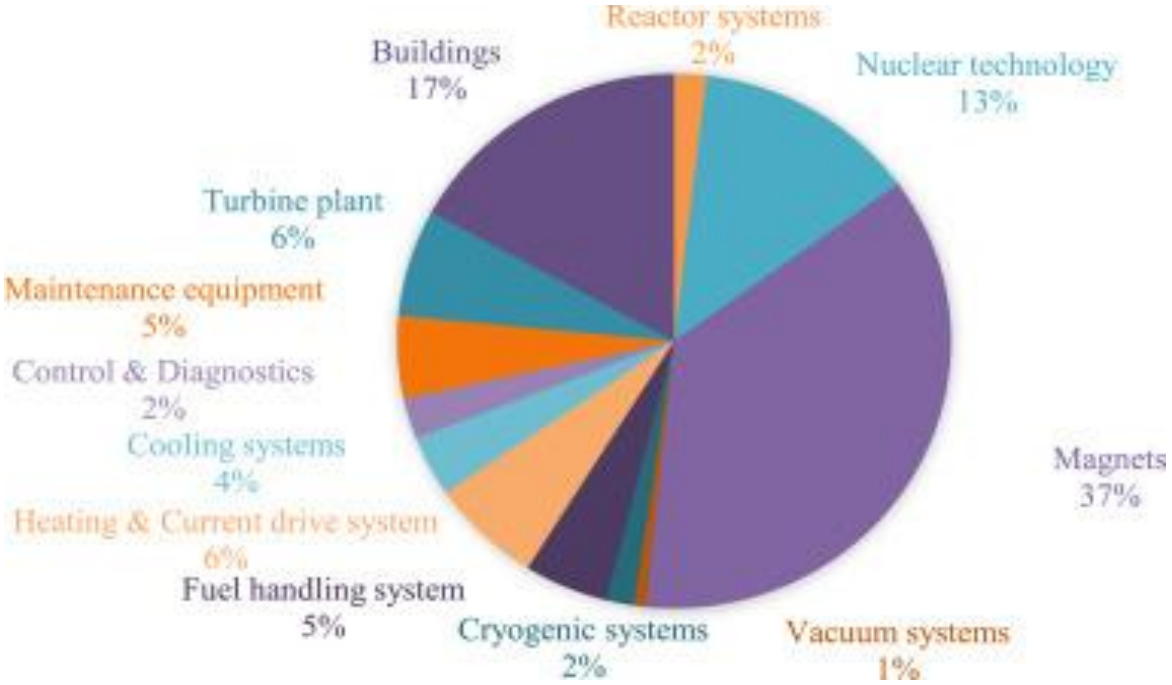
04 - The economics of nuclear fusion



MAGNETIC FUSION ENERGY ECONOMICS

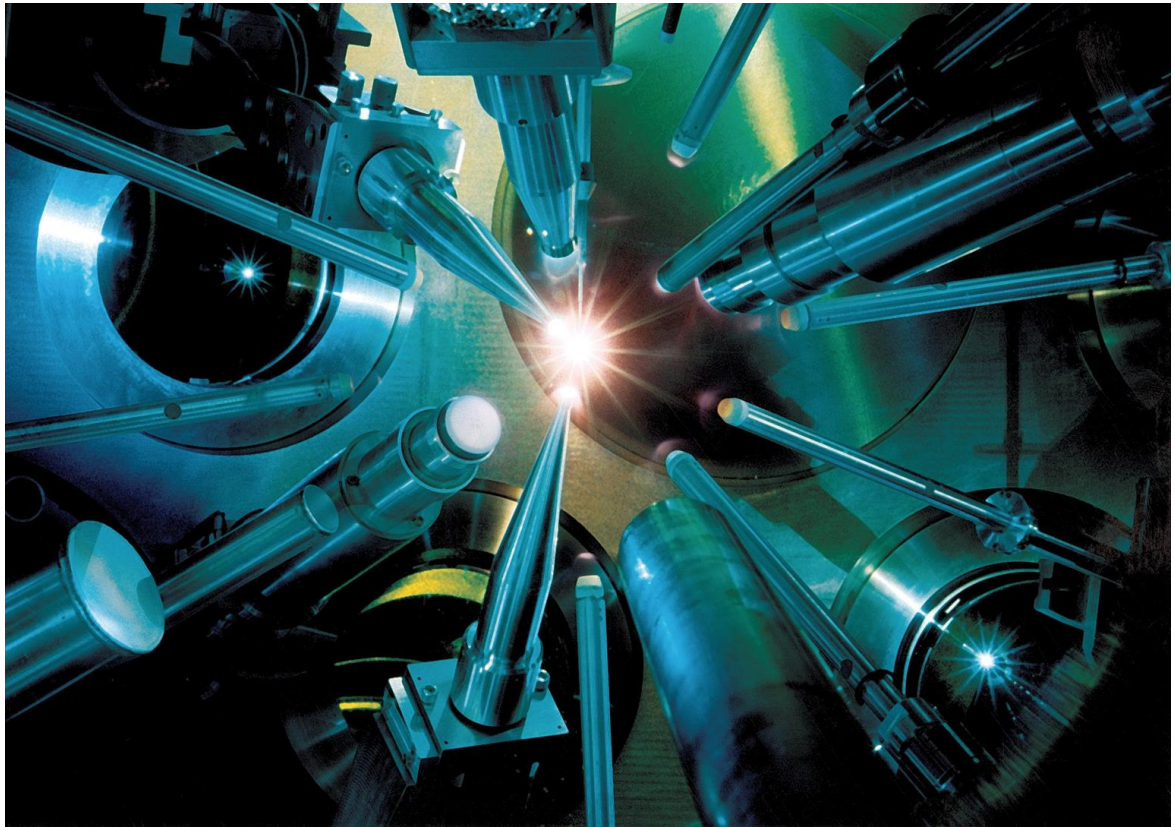


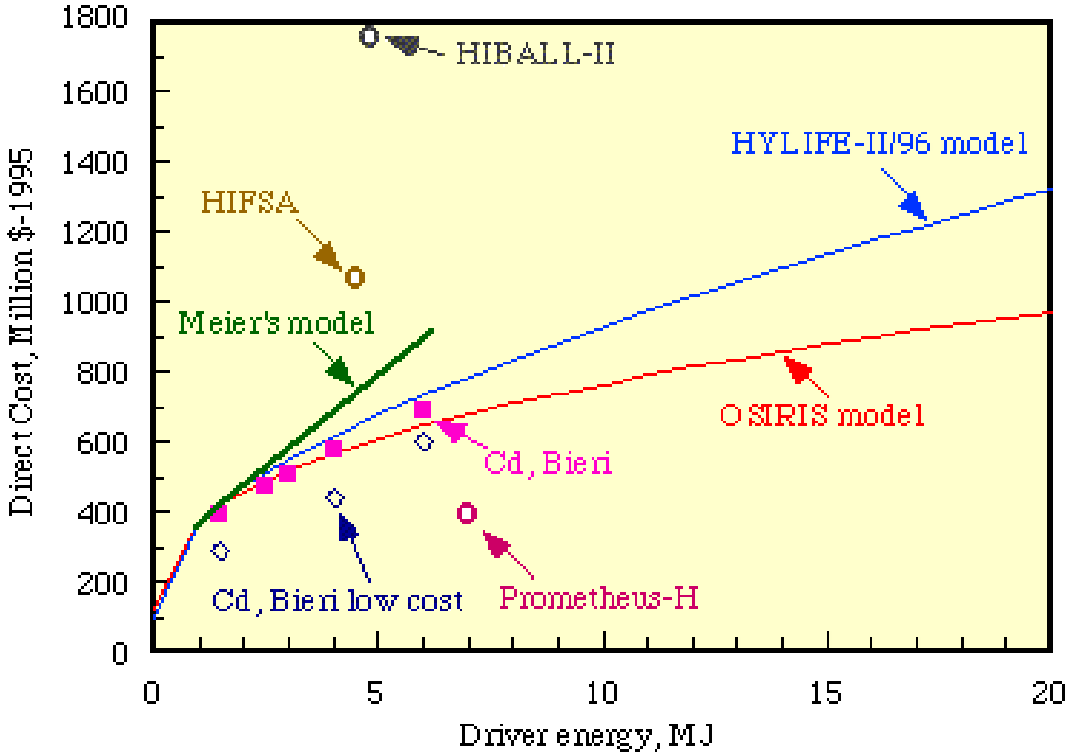




An example of the structure of the direct costs of a nuclear fusion plant (DEMO2 reference model, in this case)

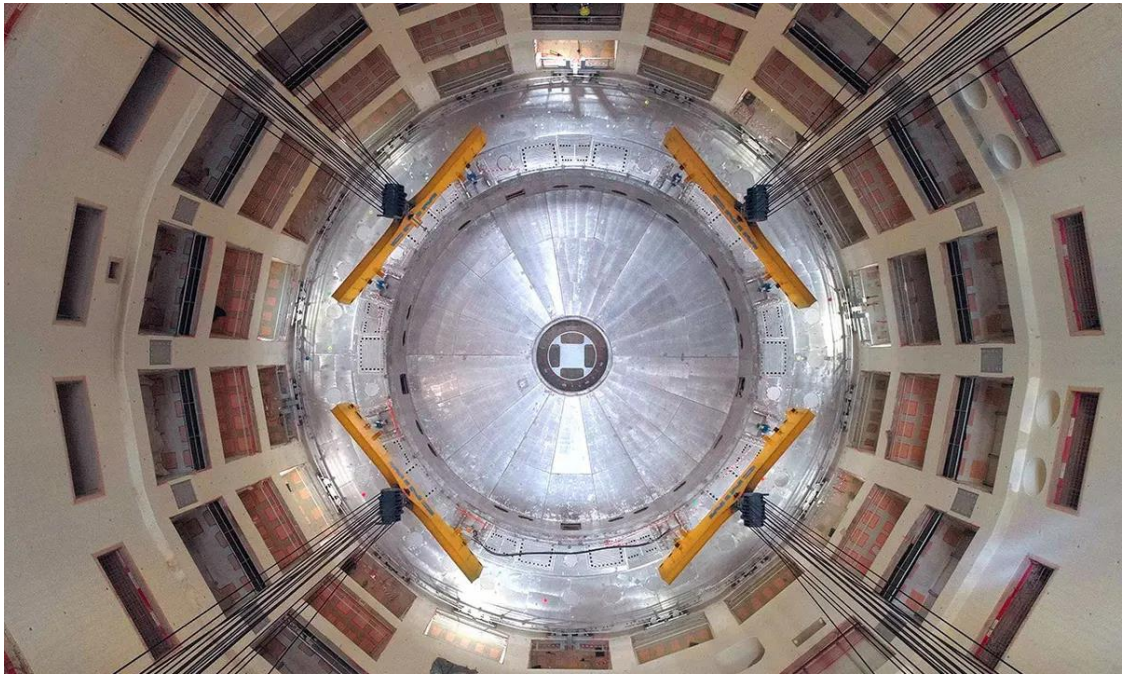
INERTIAL FUSION ENERGY ECONOMICS



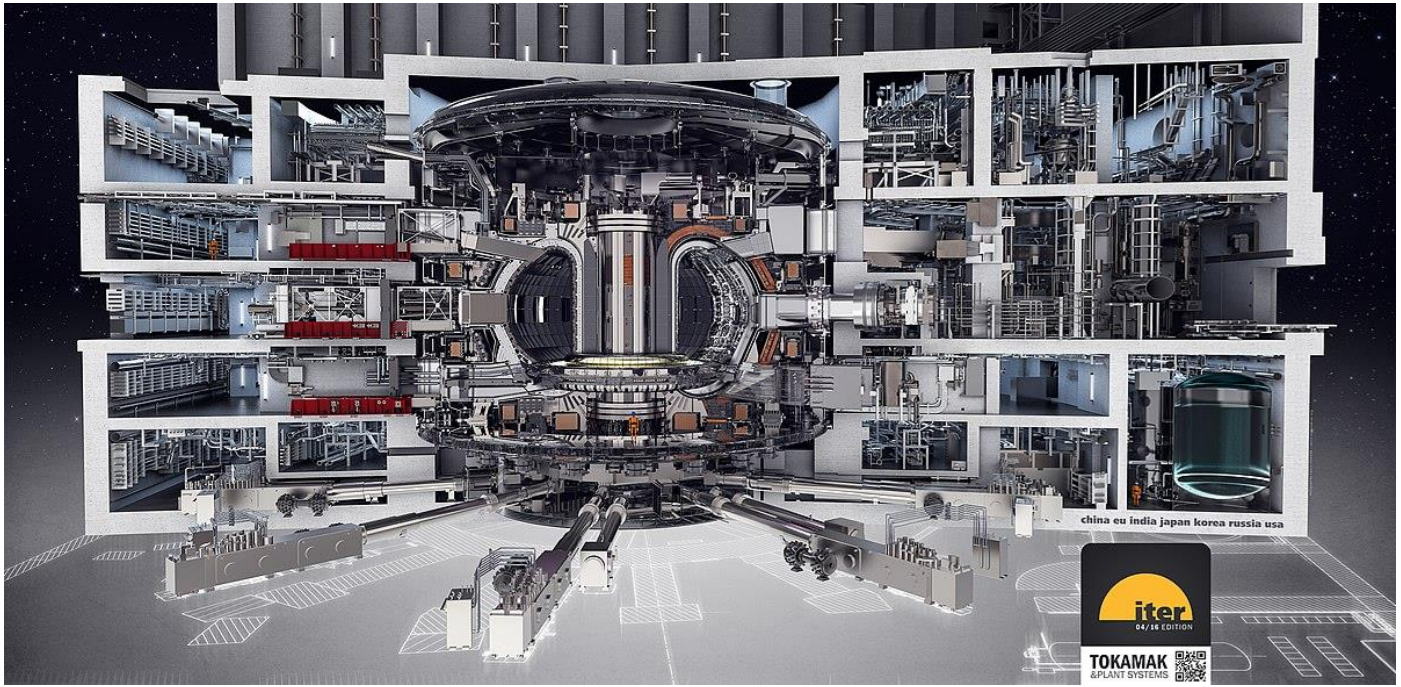


Energy-cost relation of drivers from many nuclear fusion projects.

05 - Projects working on solutions

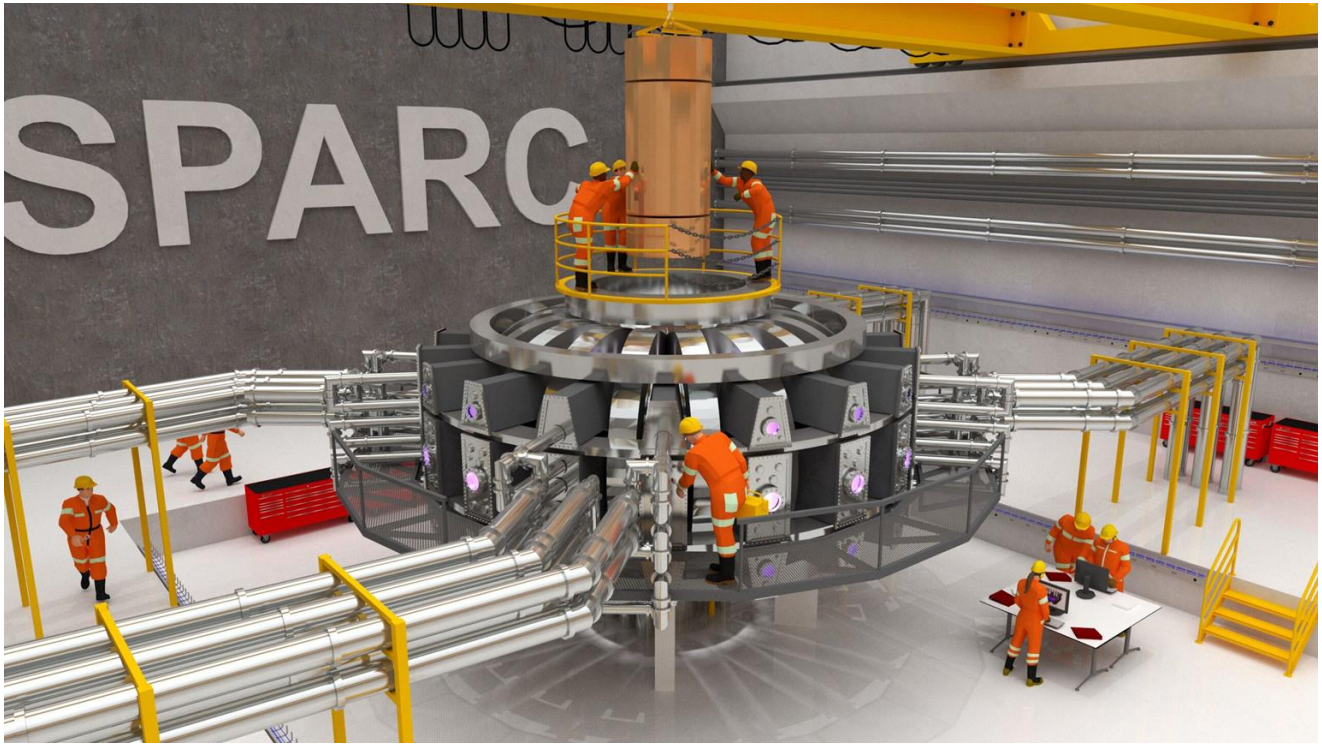


ITER

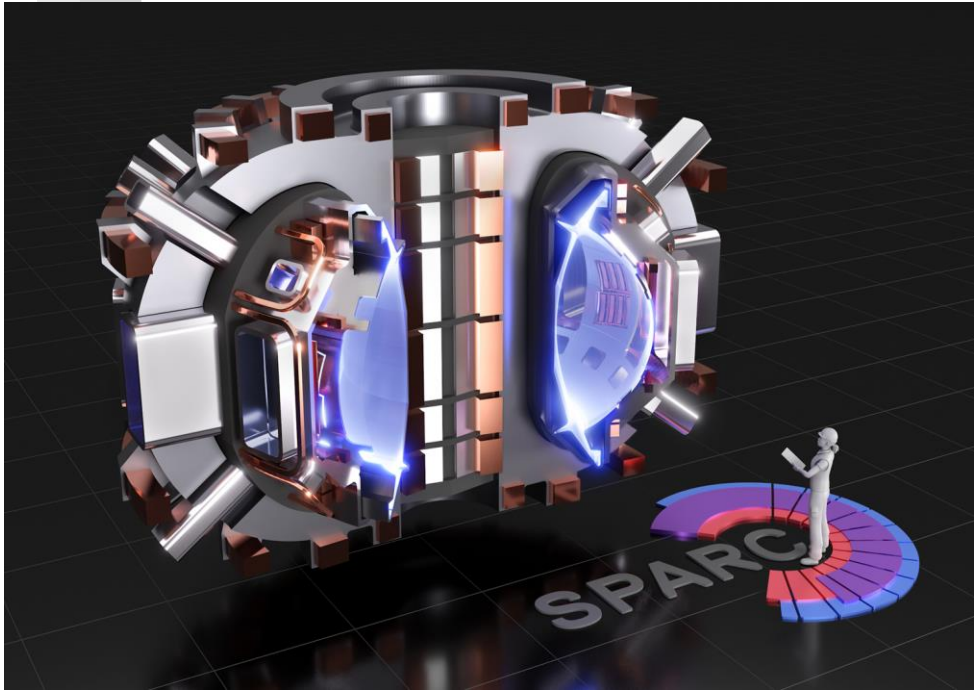

china eu india japan korea russia usa
iter
04/16 EDITION
TOKAMAK
&PLANT SYSTEMS

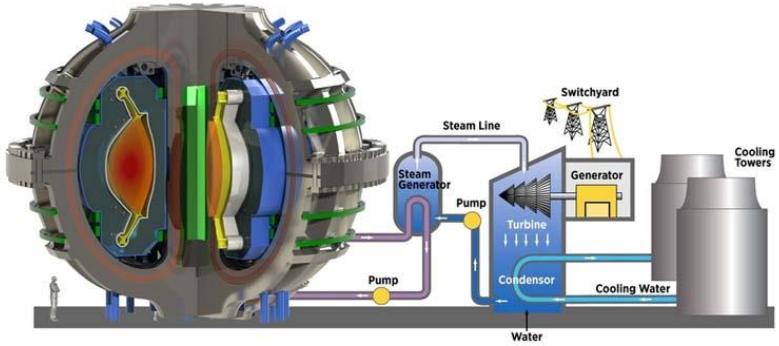
Assembling the machine.

SPARC

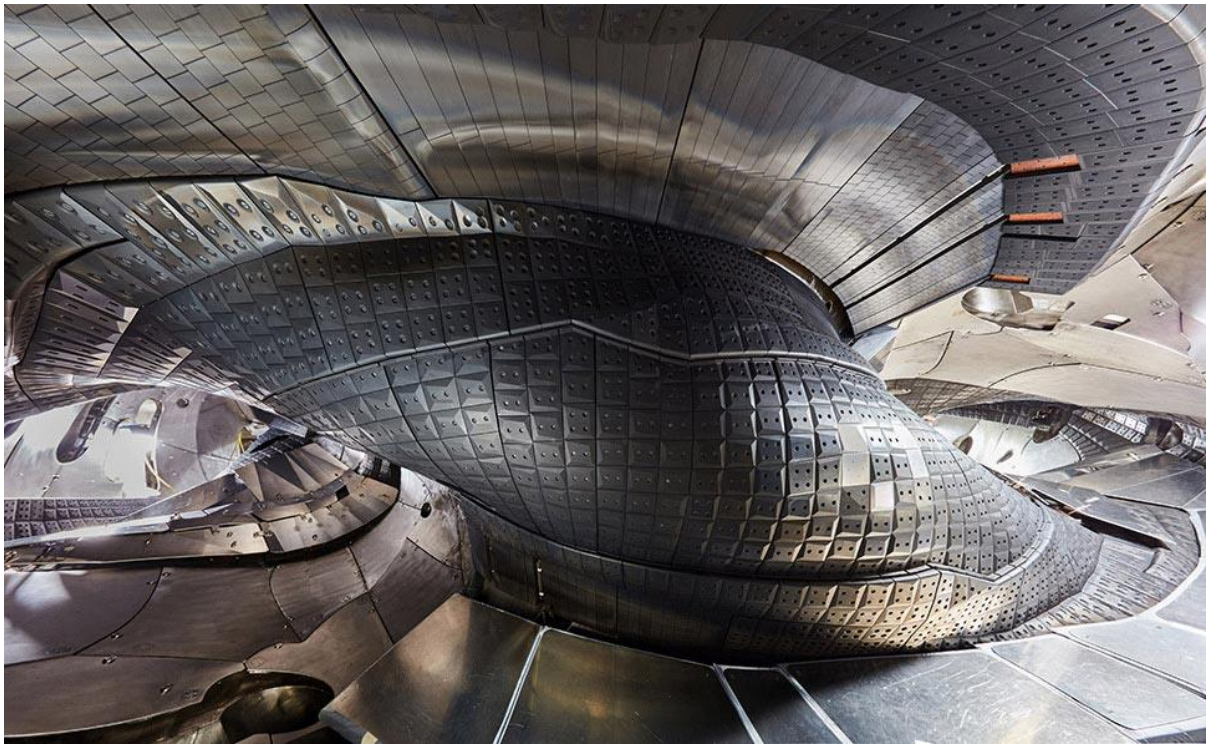


SPARC Tokamak’s design.

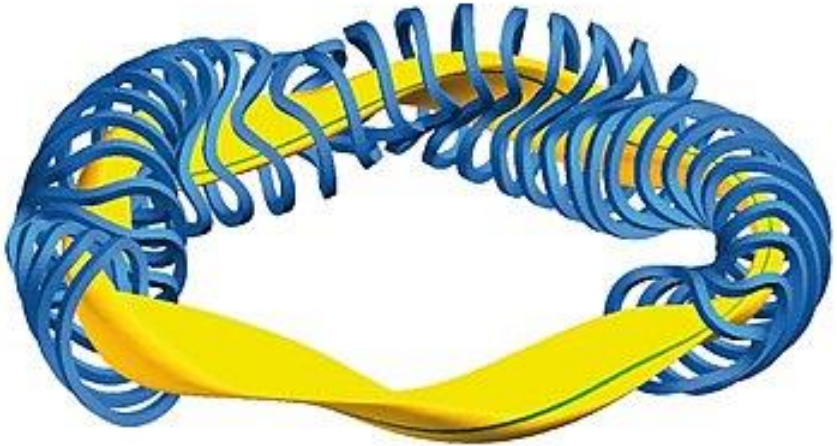


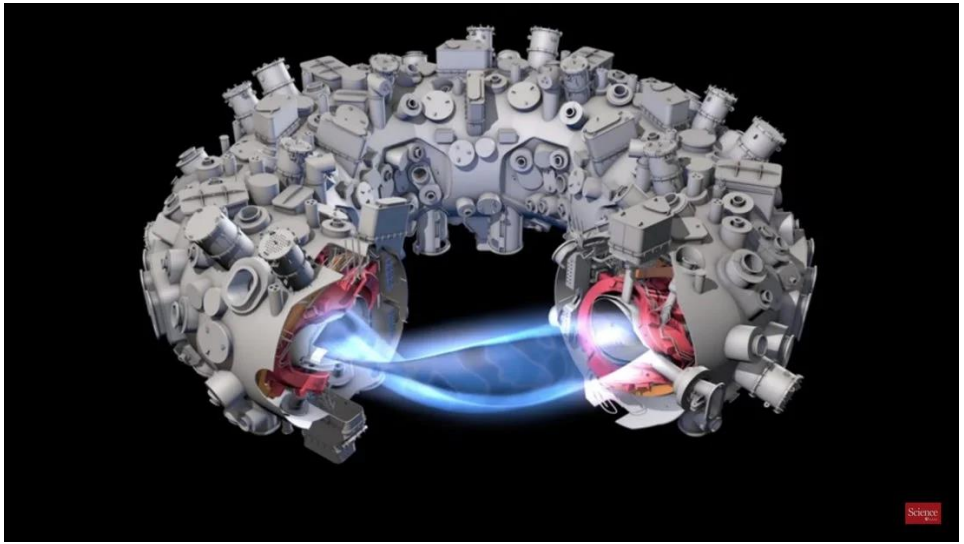


Weldenstein X-7



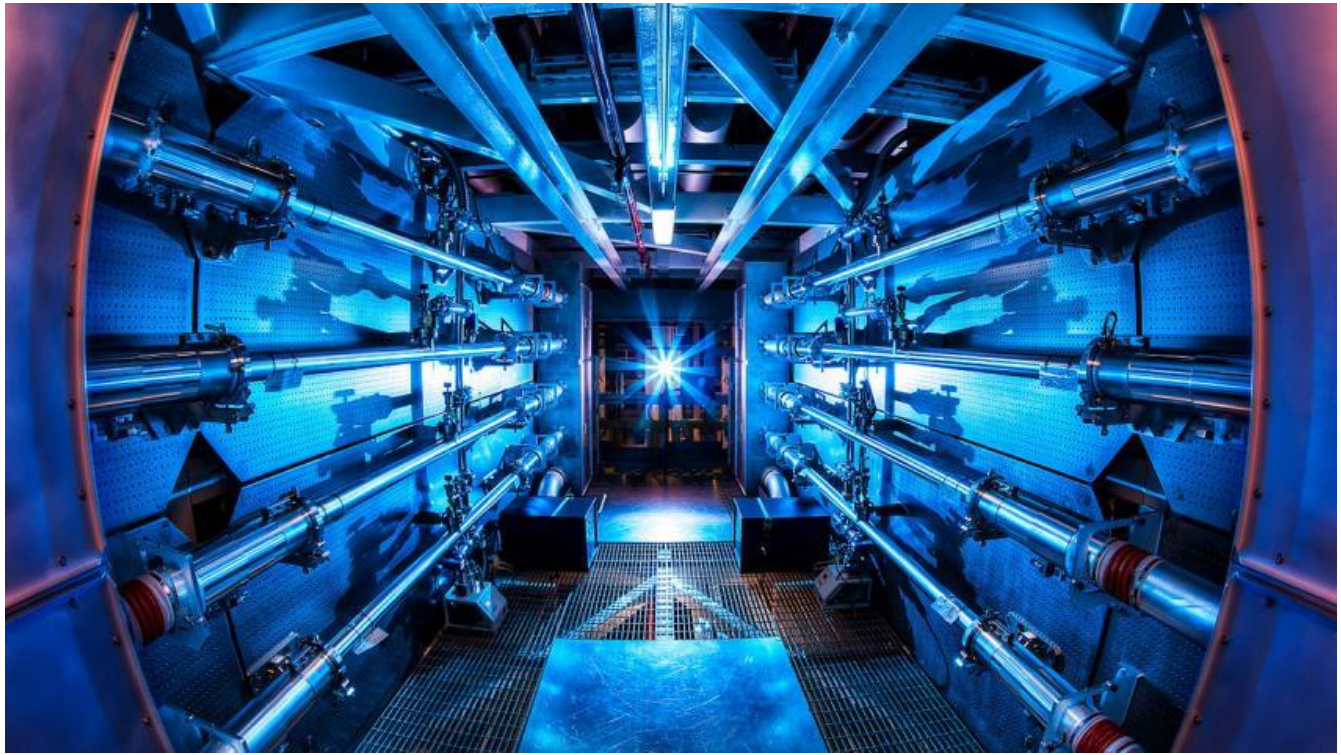
Weldenstein X-7 stellarator's design.





W-7X – Max Planck IPP, Greifswald.

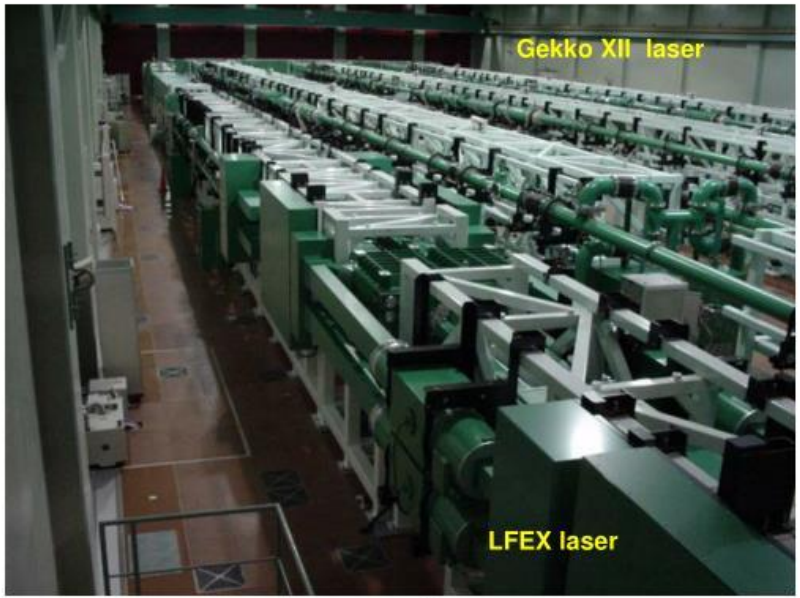
NIF



FIREX-1

FIREX-1 project has been started to demonstrate Ti = 5 keV.

ILE, Osaka



06 - CONCLUSIONS

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Possibilities of using energy provided from nuclear fusion in the near future

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