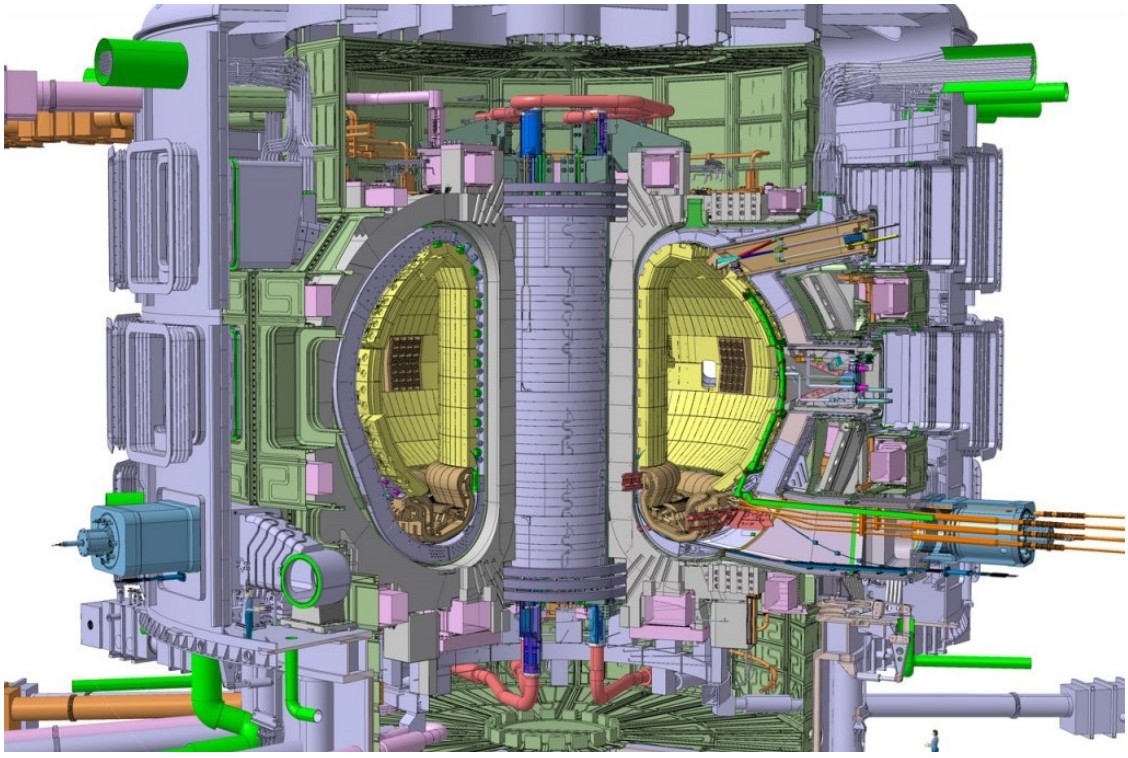
Conférence AIECAM

Academic year 2021-2022
47th AIECAM Energy Club Conference
October 28, 2021

ITER and the development of nuclear fusion

Lecturer : Jozef ONGENA, PhD,

Introduction to the study trip organized by the Energy Club AIECAM at CERN and at ITER from November 4th to 6th, 2021



The ITER machine is based on the tokamak concept of magnetic plasma confinement, in wich the fusion fuel is contained in a doughnutshaped vessel.With a height of 29 m and a diametre of 28 m, ITER will be the worlds largest tokamak (ITER Organization -COM_IMAGE_DOWLOAD)

CV Jozef Hongena :Jozef Ongena is currently Research Director at the Laboratory for Plasma Physics of the Royal Military Academy (LPP/RMA) in Brussels. He has been the President of the Belgian Physical Society since 2014 and is a member of the Royal Flemish Academy of Belgium for Sciences and the Arts.
He did his undergraduate and graduate studies in low temperature plasma physics at the University of Gent, where he obtained a PhD in 1985. Two years later, he began his career at the LPP/RMA under the then director Professor Paul Vandenplas, and joined the collaboration with the Institut für Plasmaphysik of the Forschungszentrum in Jülich (Germany).
He is specialised in ion-cyclotron resonance heating and neutral-beam injection heating of fusion plasmas, with confinement studies made on the Tokamak TEXTOR.
He also contributed to the development of the Radiatively Improved Confinement Mode : he is strongly involved in the ion-cyclotron range of frequency (ICRF) heating of the plasma in the Joint European Torus (JET)

ITER and the development of nuclear fusion.

Outline :

1. Physics of fusion reactions :
    - Energy gain in fusion reactions
    - Some facts about our our sun
    - p-p reaction in the sun
    - On earth: use deuterium and tritium
    - ‘Easiest’ fusion reactions on earth
    - Advantages of fusion
2. Magnetic fusion research in Europe and the world
    - Magnetic Fusion : a real challenge
    - Fusion research in Europe
    - EU Fusion Roadmap
    - Principle of magnetic fusion
    - Final Configuration Toroidal Configuration
    - Realizing a helical magnetic field
    - How to create the ultra high temperatures needed ?
    - The main difficulty of magnetic fusion: keep a huge T gradien

Characterizing progress

- Largest operating tokamak: Joint European Torus (JET)

3. ITER : Planning a prototype fusion power plant, from JET to ITER
4. Construction of ITER : A complex international endeavour
5. Important technological advances in recent years
6. Conclusions

Useful information :

This conference introduces the trip to CERN in Geneva and to the ITER Site in Cadarache. This is primarily intended for travel participants.
For travel participants, access to the conference is included in the price of the trip.
Those not participating in the trip are welcome to attend the conference; a contribution of 10 € will be asked of them. (payment on site).

Registration form : here

Date: Thursday, October 28 at 7:30 p.m.

Location: ECAM Brussels Engineering School, Promenade de l'Alma 50, 1200 Woluwe-Saint-Lambert.

Marc Deffrennes.
Maurice Dodémont.
Jean-François Theunissen