



DAES

BSBF 2022 PRESENTATION

Oct. 2022

# AGENDA

- GLOBAL OVERVIEW
- BIG SCIENCE PROJECTS
- CURRENT CHALLENGES
- CONTACTS



# OUR STORY

## DEVELOPMENT OF ADVANCED ENGINEERING SOLUTIONS



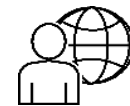
An association born out of collaborations **On major scientific and industrial projects**



A first activity outsourced for Nuclear medicine. Original expertise in numerical **simulation applied to energy and nuclear for** large projects (ESS, ITER, etc. )



Integration into the CERN Alumni **Network and Cern KnowledgeTransfer**



Democratization and deployment of this **expertise to other industrial sectors: human performances medtech sports, watchmaking, mobility.**



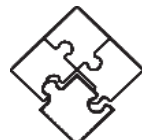
Knowledge Transfer





# OUR STORY

## DEVELOPMENT OF ADVANCED ENGINEERING SOLUTIONS

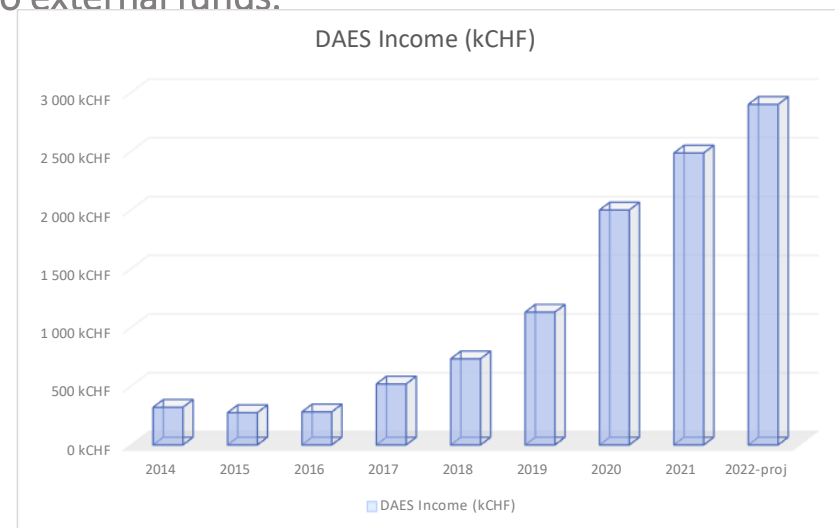


Constant and robust growth since 2014

20% of income dedicated to internal innovative projects



**Independent:** Owned by the 3 operational directors.  
No external funds.



Knowledge Transfer





# OUR OBJECTIVES

« WE MASTER PROGRESS THROUGH THE POWER OF SIMULATION. »

- S(t)imulate tomorrow's successes today
- Reliability thanks to the digital twin
- Accelerate time to market
- The PoC Corner: Enhance the value of ideas, projects and commercial offers



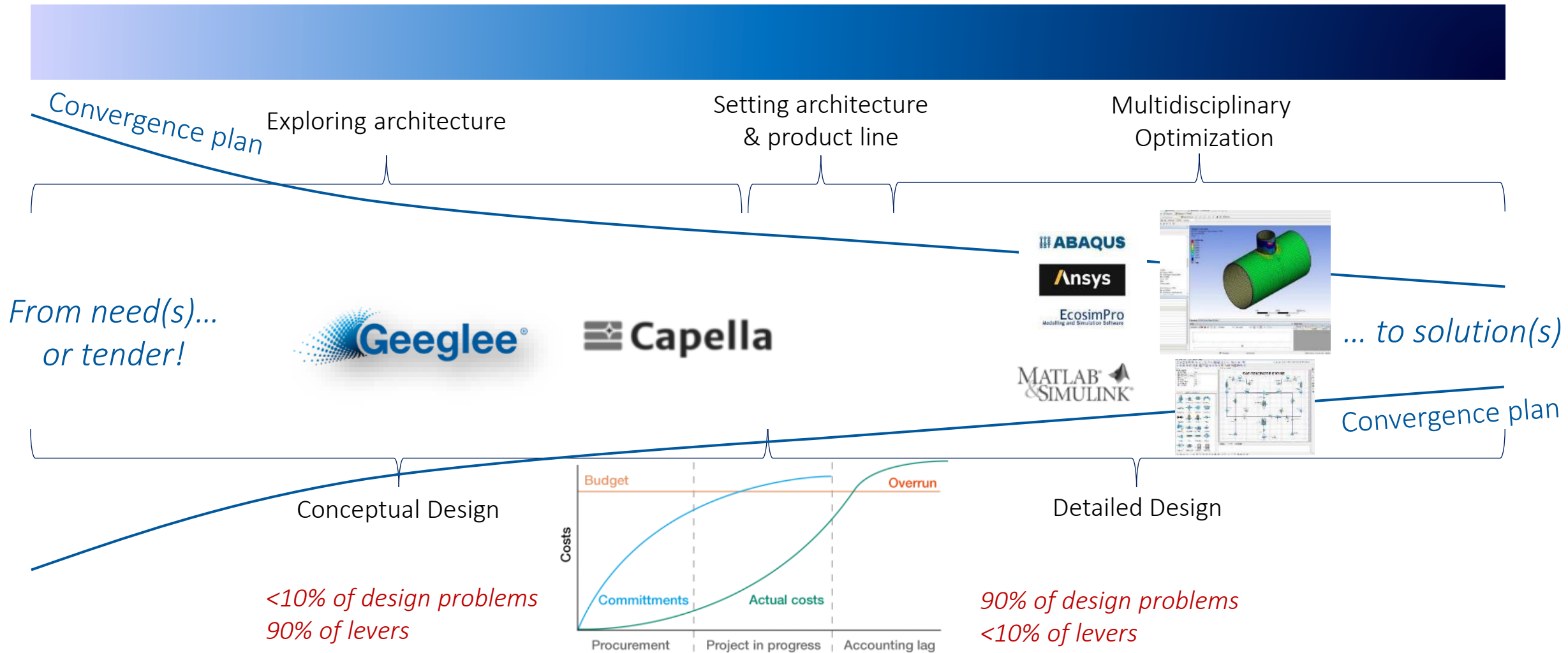


# OUR SERVICES

ENGINEERING



# YOUR EXTENDED COMPANY

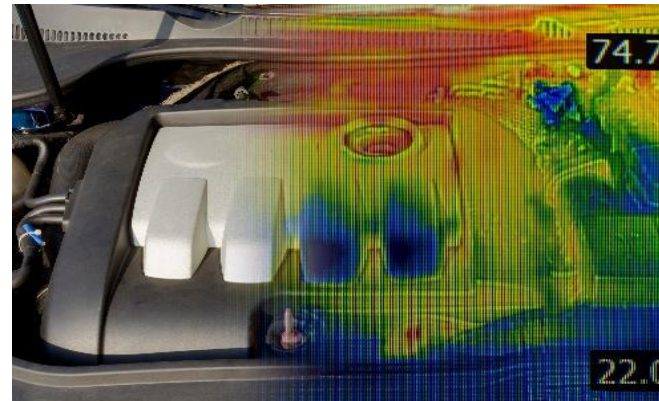


# EXPERTISE



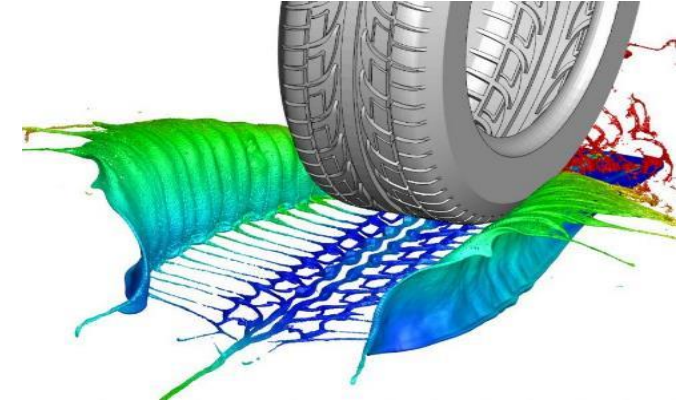
## STRUCTURAL

- Contacts
- Large déformations
- Coupling with CFD
- Fatigue
- Non linear material models (plasticity, hyperelasticity,...)
- Modal analysis
- Spectrum, PSD analysis (random vibration)
- Dynamic explicit



## THERMAL

- Analytical calculations
- Phase change
- Temperature dependant properties
- Radiation, forced and natural convection and conduction heat transfer
- Heat deposition

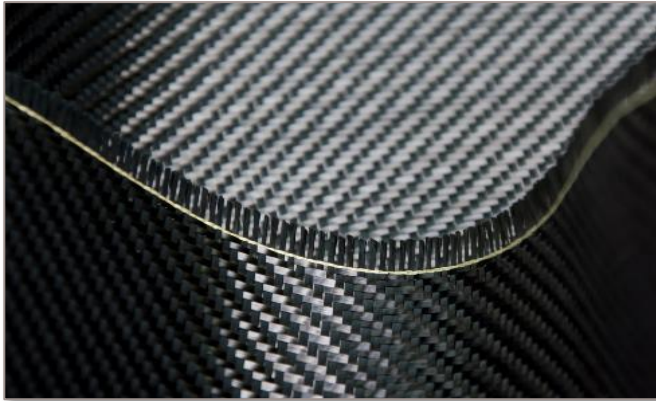


## CFD

- Laminar and Turbulent flow
- (in)Compressible
- (non)-Newtonian
- Multi phase (1.e free surface)
- Phase change
- FSI (Fluids Structure Interaction)
- Conjugate heat transfer (CHT)
- Particle transport
- Subsonic and supersonic regime



# EXPERTISE



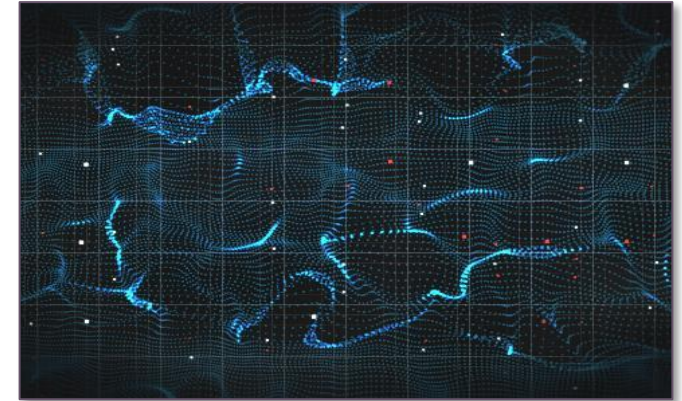
## MATERIALS-COMPOSITES

- Hyper elastics materials
- Viscoelastics materials
- High density and low density foams
- Highly compressible foams
- Fiber reinforced polymers (carbon & glass)
- Bio-based materials
- Titanium and high performance alloys



## DYNAMICS & SEISMIC

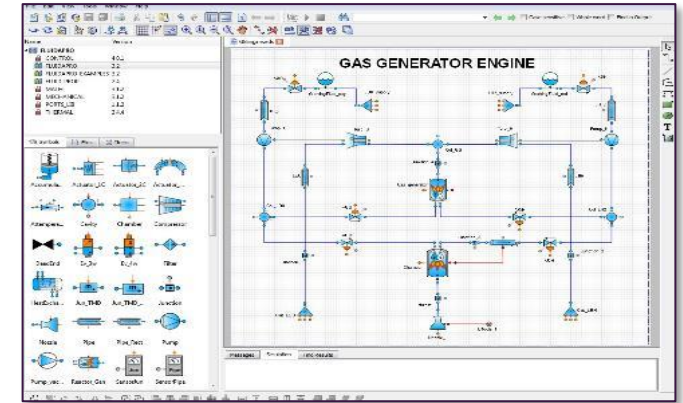
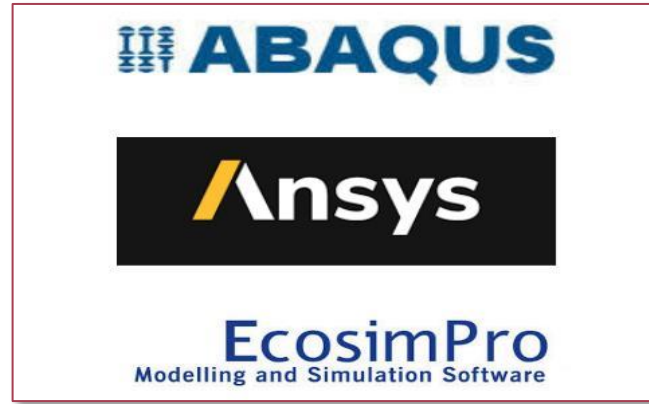
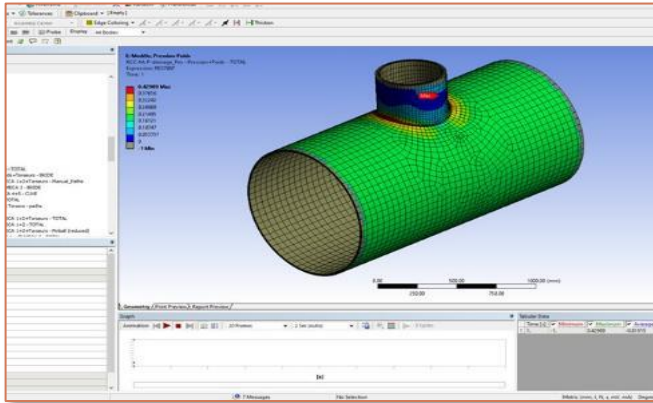
- Shock
- Blast
- Perforation
- SPH & ALE Methods
- Strain rate dependent materials
- Safety and operational seismic classification
- Seismic diagnostic simulations of the entire facility



## ELECTROMAGNETISM

- Low Frequency
- EMC

# EXPERTISE



## APPS & SCRIPTS

### Pre-Processing tools

- SpaceClaim apps for screws and welds
- Workbench apps for p+ heat deposition in thin structure

### Post-Processing tools

- Workbench apps for RCC-M and RCC-MRx usage factor calculation

## POWERFUL SUITES

- LS-DYNA
- FLUENT / CFX
- Code\_aster
- Open Modelica
- FLUKA
- MCNP

## PROCESS SIMULATION

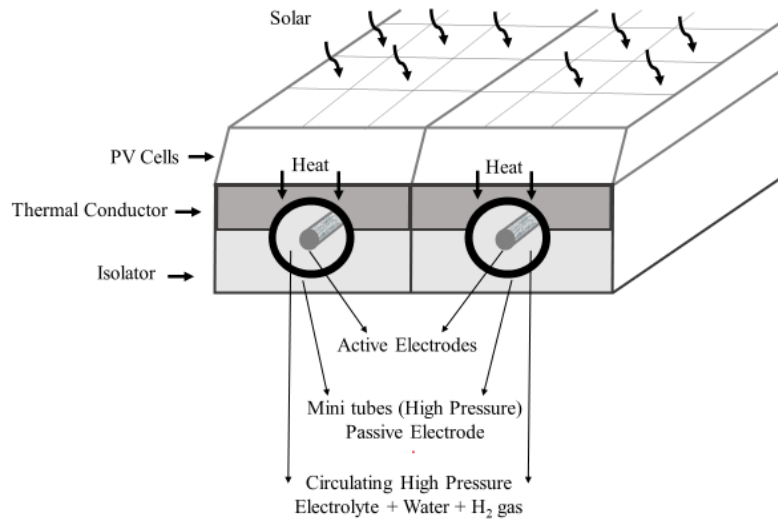


# OUR SOLUTIONS

HIPHEL-PV ELECTROLYSER  
COMPACT SHORT PULSE  
NEUTRON SOURCE

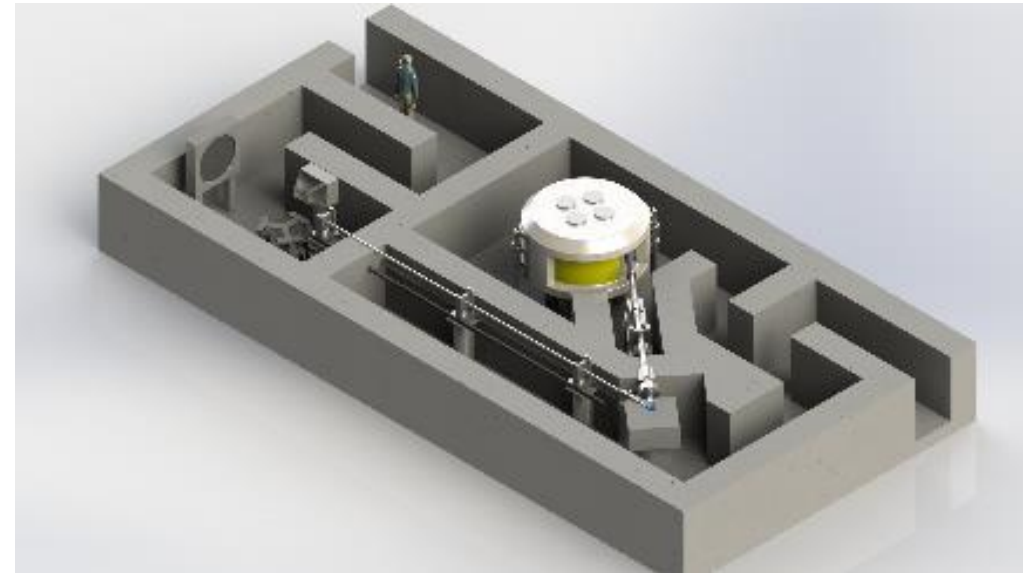
# INNOVATIONS

H<sub>2</sub>O Electrolyser  
=> High pressure Gaseous H<sub>2</sub>



Compact Short pulse Neutron Source +  
Instrument

=> industry



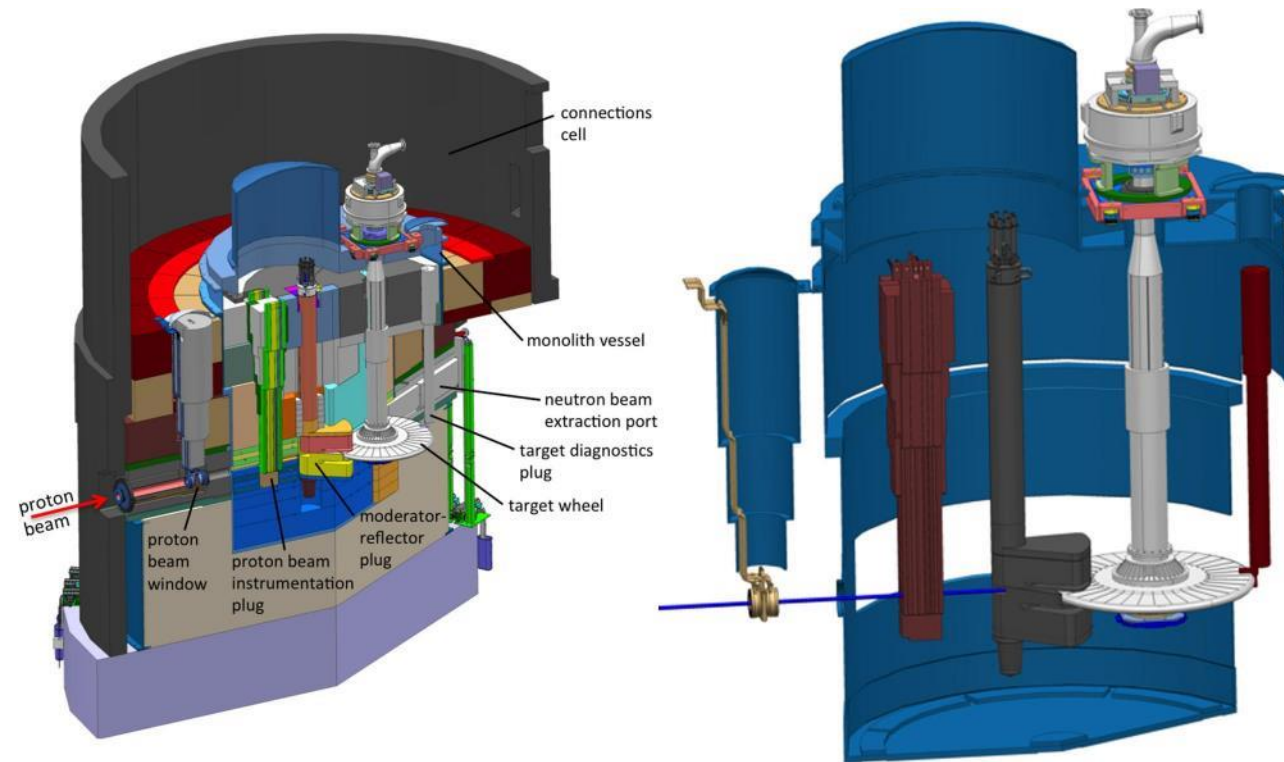


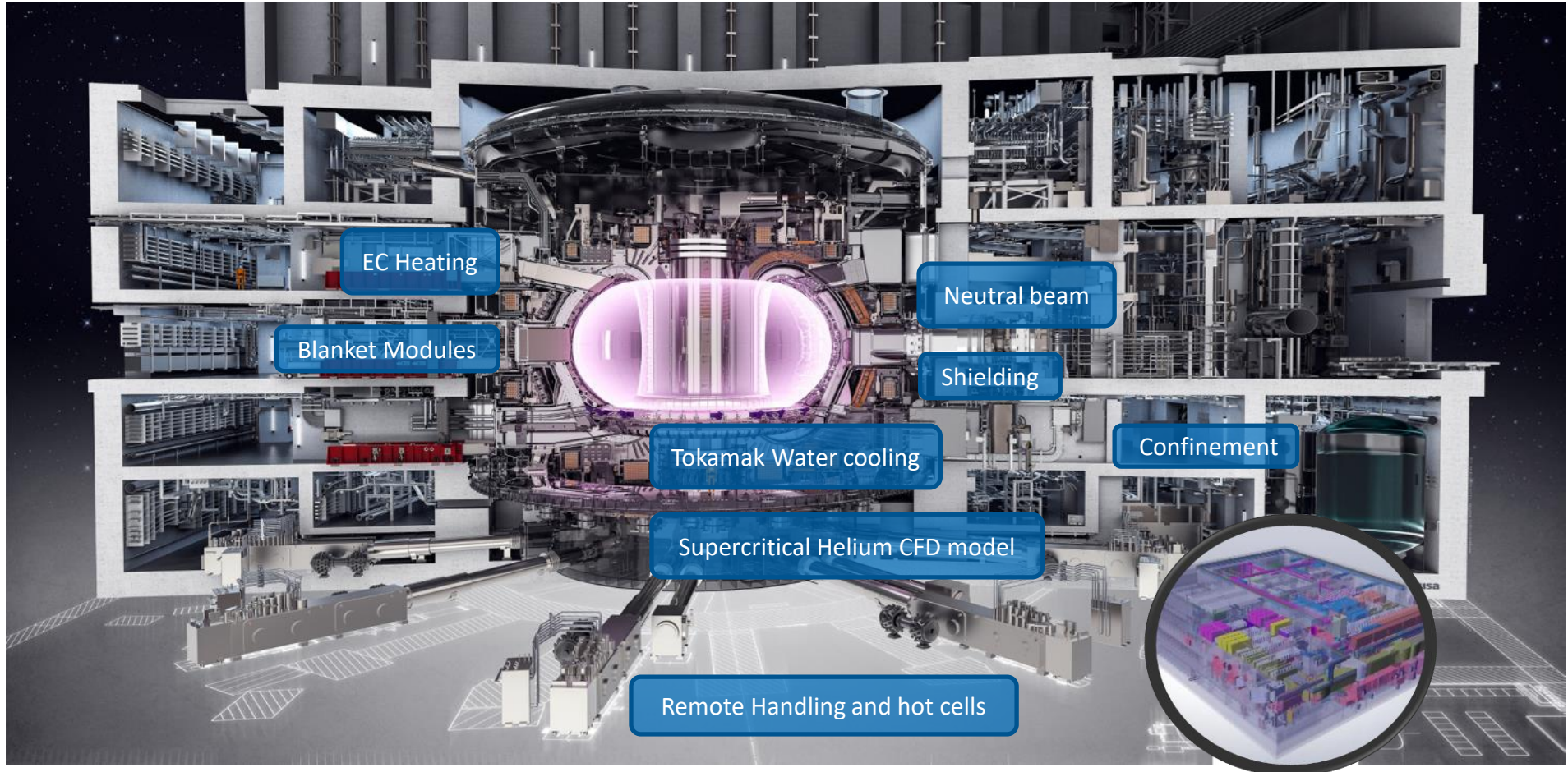
# OUR STORY WITH BIG SCIENCE

A LONG STORY

# MAJOR SCIENTIFIC & INDUSTRIAL PROJECTS











IS BIG SCIENCE COMPATIBLE WITH SMALL COMPANIES?



# IS BIG SCIENCE COMPATIBLE WITH SMALL COMPANIES?

## BIG SCIENCE FACILITIES VIEWPOINT

- Highly specialized
- Prototypes
- Public tenders – Admin
- Public tenders – Admin
- Public tenders – Techn. View
- Non-obvious Design processes

## SME VIEWPOINT

- Yes we are!
- Not in the scope of large companies
- Challenging! (reliability in time?)
- Process can be long!
- Dialogue is possible
- Flexibility!



# EXTENDED TEAM INFINITE GAME



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## TO TAKE AWAY

We help you building your advanced engineering solution

We perform high level simulations

We create customised tools and softwares for you

We accelerate the use of software and tools to strengthen your digital chain

We believe in the power of networking and partnerships

We share passion for innovation and technologies

We'll be glad to meet you at our booth!





MERCI



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