



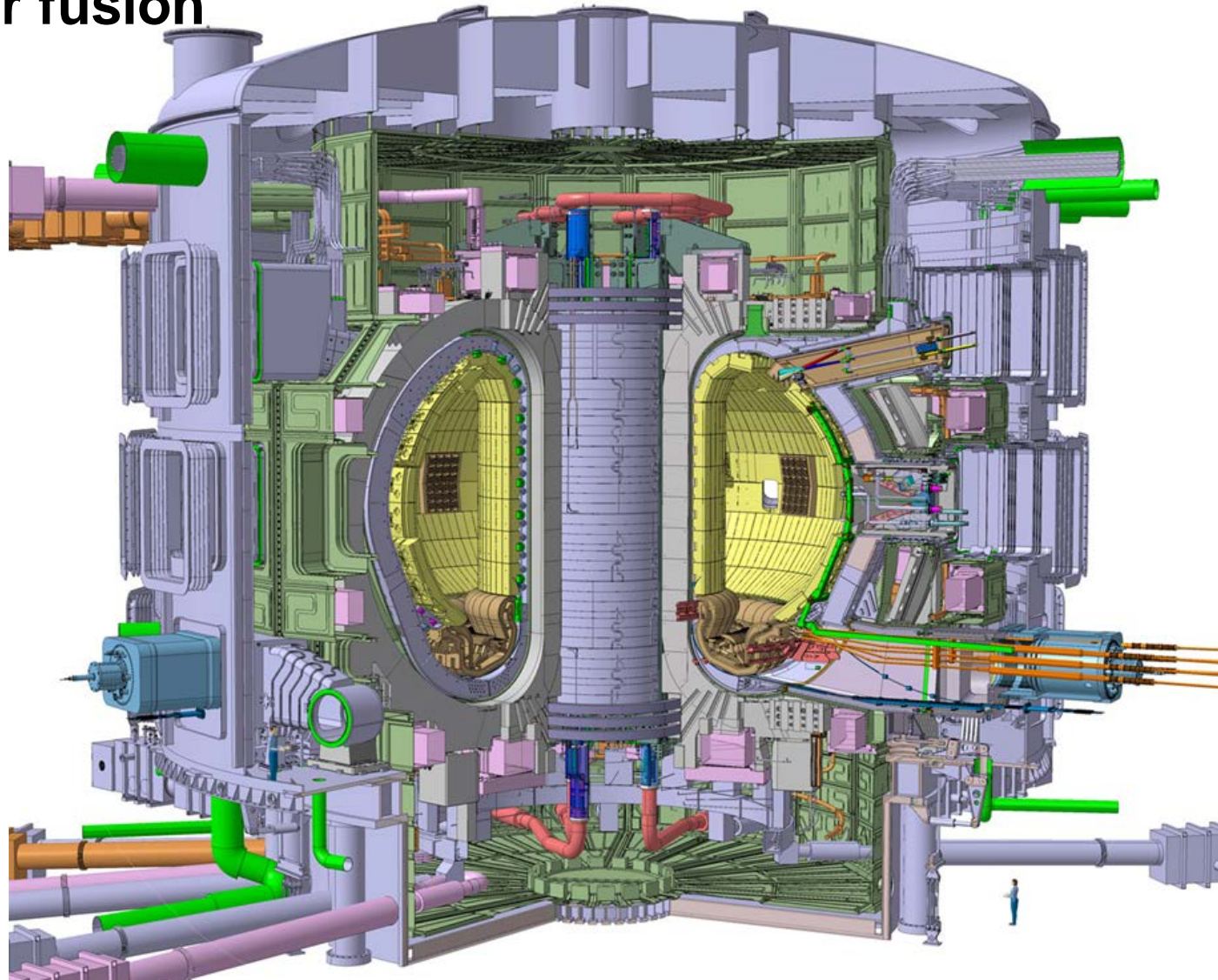
# Big Science Instrumentation cases

16 October 2013





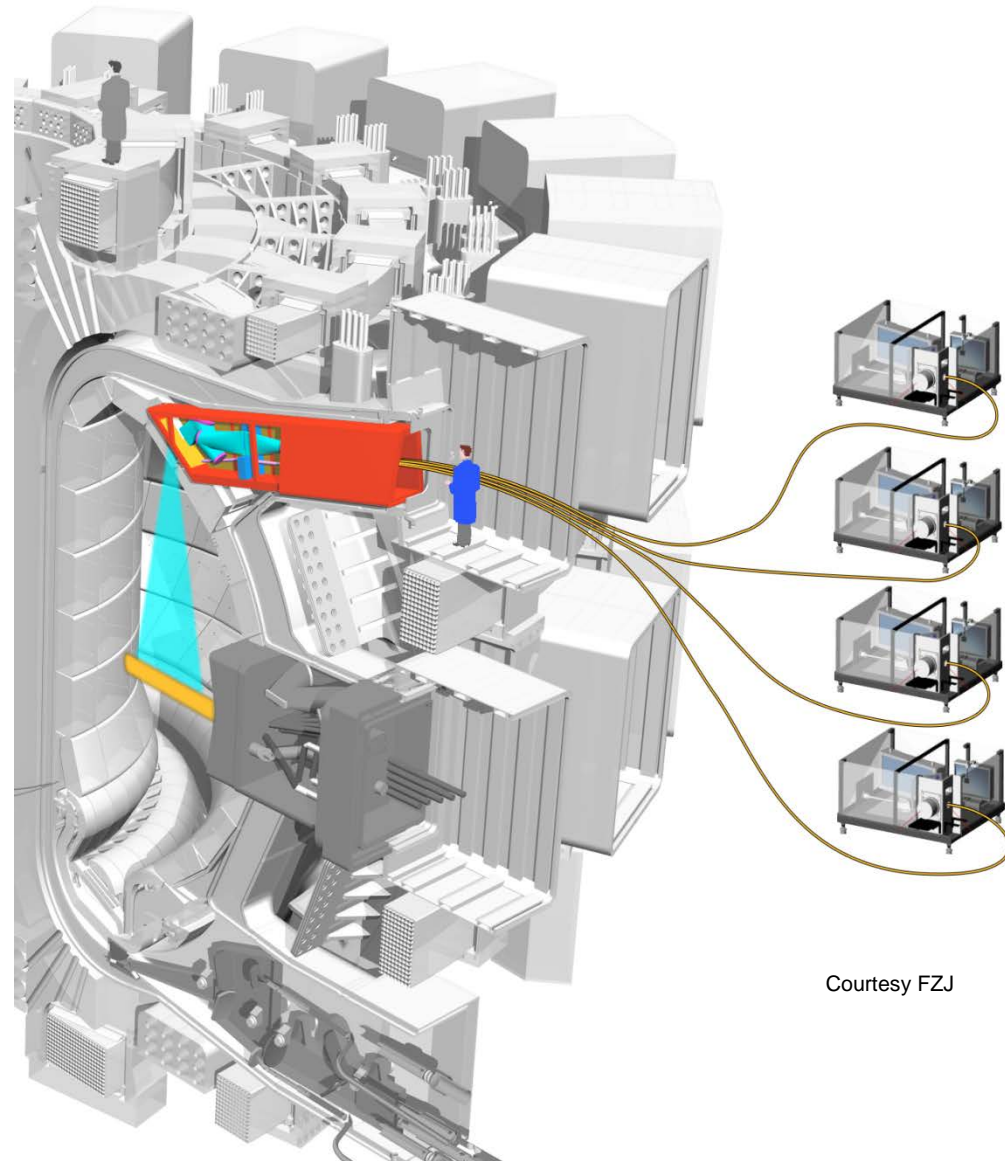
# ITER nuclear fusion





## CXRS diagnostic system

- › Diagnostic portplug for Charge Exchange Recombination Spectroscopy (CXRS)
- › Spectrometer system
- › Fiber link between portplug and spectrometer
- › Data acquisition & processing system



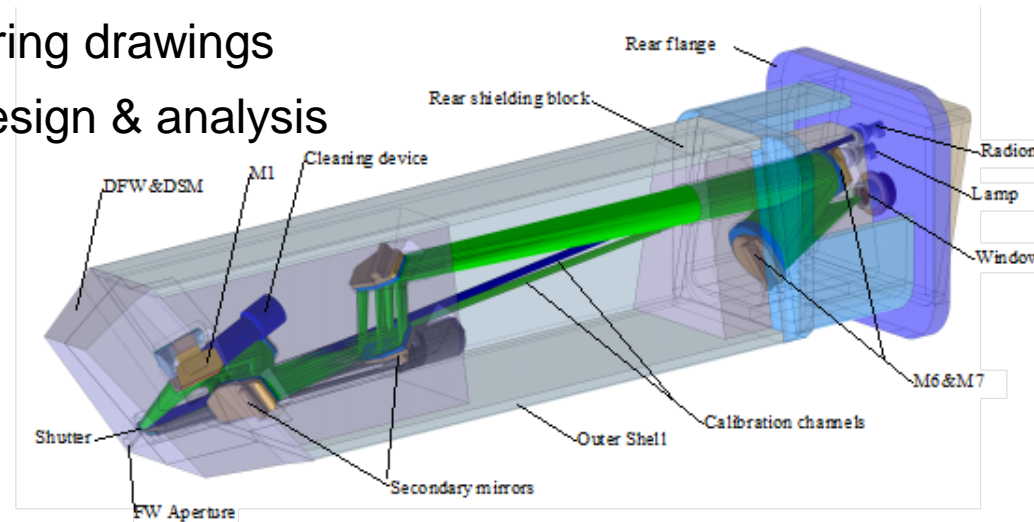


## Main industrial tasks

### › Framework Partnership Agreement (FPA, 2014-2017)

#### › In vessel components:

- design up to manufacturing drawings
- Optical & mechanical design & analysis
- Secondments in Julich



#### › Ex vessel components

- Spectrometer, fibers, cameras, electronics

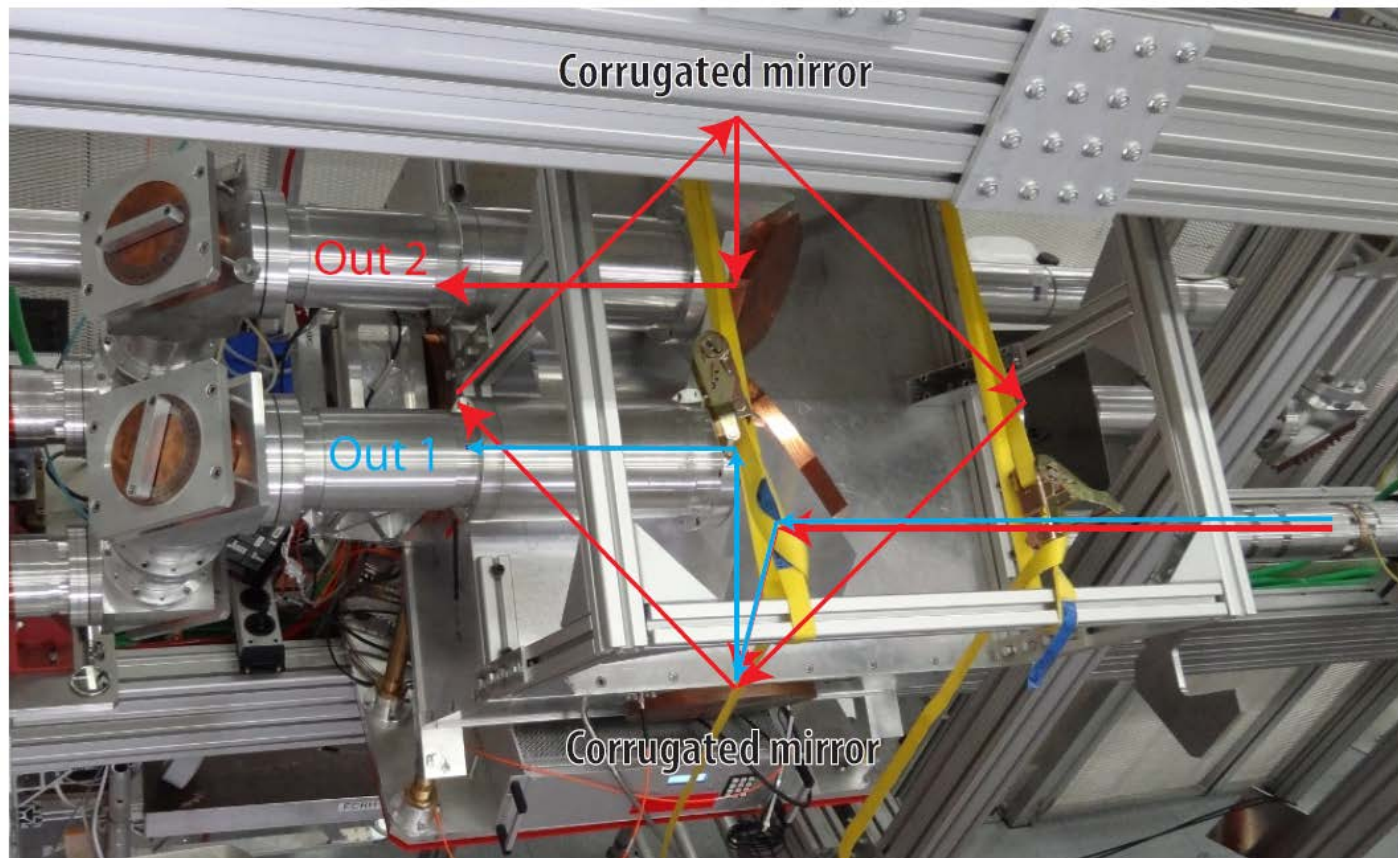
#### › Breadboarding:

- First mirror, with integrated cooling
- Shutter
- Cleaning system



## FADIS = subsystem for ITER heating:

- prototypes and tens of systems needed
- ex-vessel, no radiation
- industrial tendering





# DESIGN AND FABRICATION OF THE ITER UPPER PORT VISIBLE/INFRARED WIDE ANGLE VIEWING SYSTEM

## SCOPE OF EQUIPMENT

One of the ITER diagnostic systems being provided by the US is the Upper Port Visible/Infrared Wide Angle Viewing System (UP Vis/IR). This system provides real-time, simultaneous visible and IR images of the ITER divertor region via optical systems located in five upper port plugs mounted on the ITER vacuum vessel. This system must function reliably with limited maintenance for many years in a high vacuum, high nuclear radiation, and high magnetic field environment, and it must be robust to repeated thermal cycling.



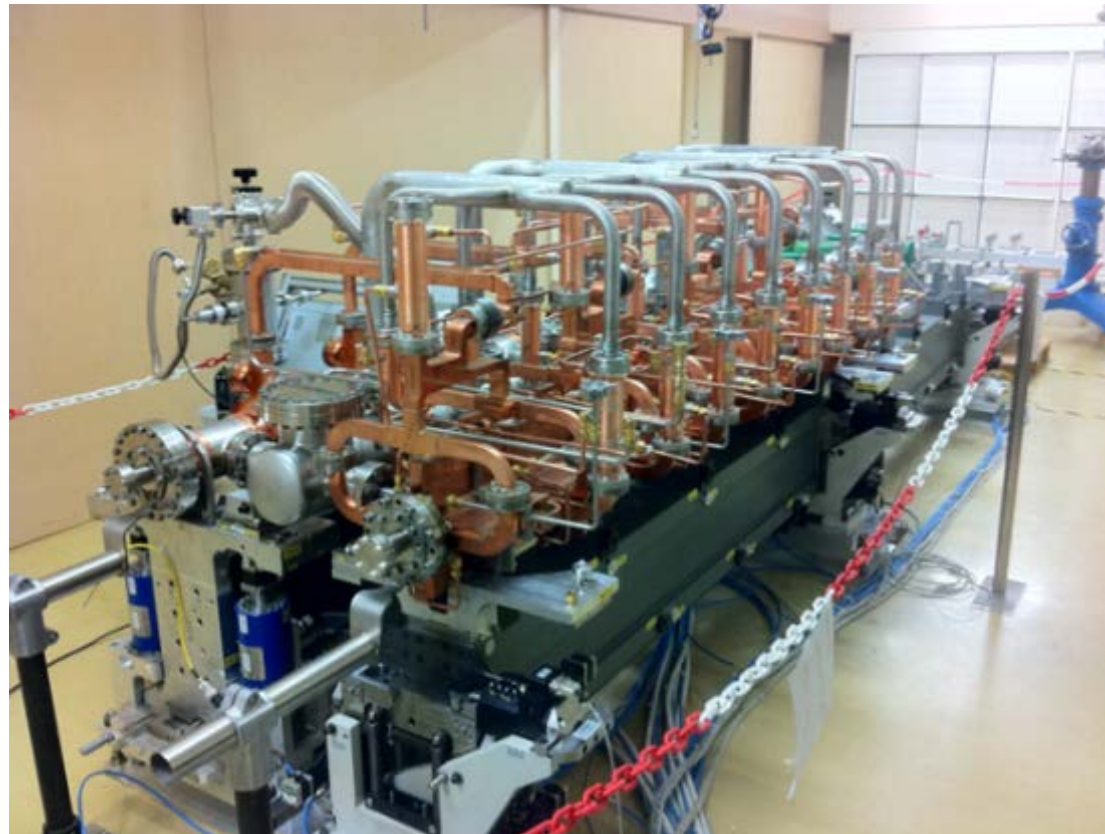
## Similar (smaller) system for JET





## **CERN: CLIC, the new generation accelerator VDL is the lead party!**

- › CERN develops CLIC, a linear electron accelerator of ~50 km long
  - › 20000 units needed
  - › 800 parts per piece
- › Looking for (industrial) partners







## ESRF - Grenoble

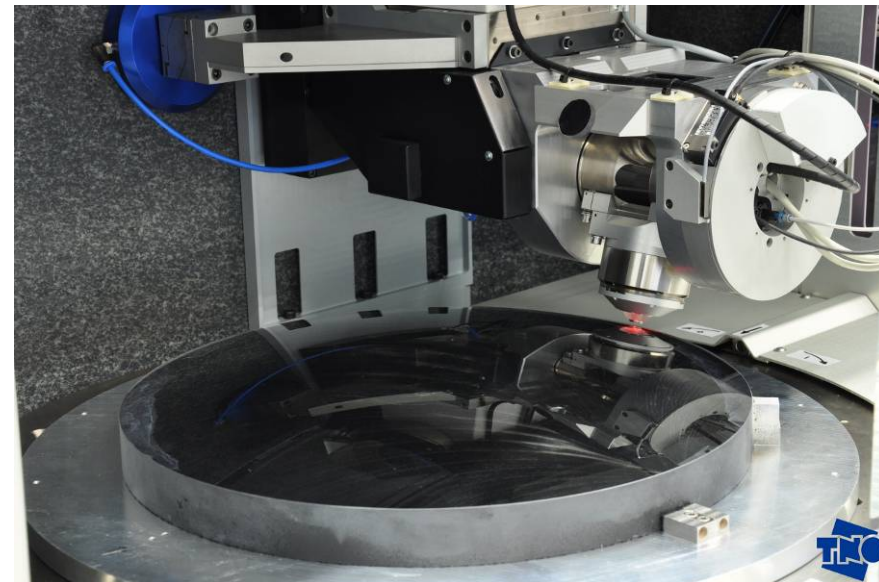
- › Tenders for Rotation/Translation systems
- › Tender for:  
**Quantitative Phase-shifting Fizeau Interferometer**





## NANOMEFOS

- › Metrology Machine characteristics
  - › Universal (from flat to freeform, convex to concave optical surfaces)
  - › Large measurement volume ( $\varnothing$  500 x 100 mm)
  - › High accuracy (15 nm,  $2\sigma$ )
  - › Non-contact, Fast (minutes)
- › **Looking for partners for Rebuild**



Thanks for your attention



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