IDOM

Science and Technology

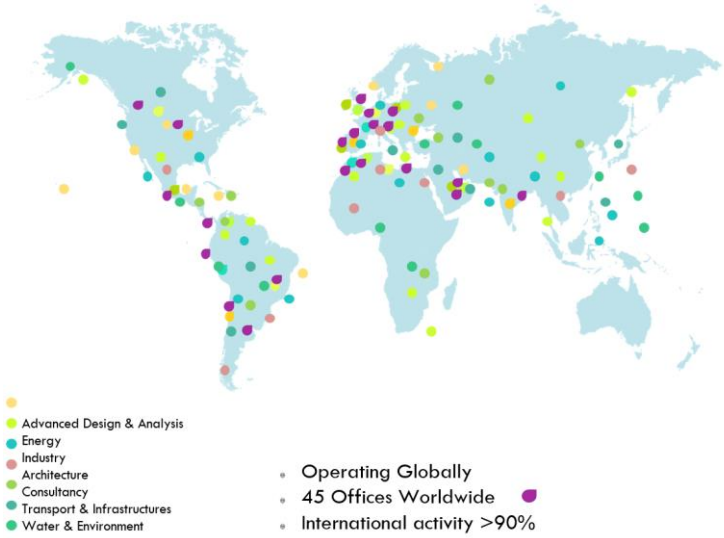
WHO WE ARE

Bilbao Headquarters

Madrid Offices

We are an independent firm providing Consulting, Engineering and Architecture profesional services, united in our way of doing things, shared objectives, the Service of our clients.

4300 Professionals	65 Years of experience	920 Partners	125 Countries



IDOM ADA Department

RESOURCES

- Operating from in Bilbao and Minneapolis offices
- Large Computing Facilities
- State of the art advanced Engineering and Scientific Software
- Prototypes and Assembly Laboratory
- Large network of associated suppliers

COMPETENCES

- Mechanical Design
- Mechatronics
- Optical Design
- Optomechanics
- Singular Structures

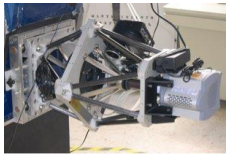
- Analysis and Simulation
  - Solid & Fluid Mechanics
  - Radiation Transport (neutronics)
  - Electromagnetic
  - System Dynamics
  - Complex Phenomena
  - Multiphysics

- **Systems and System Integration**
- **Turnkey System Provider**

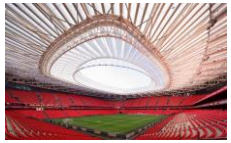
MARKETS

Scientific Facilities.
Big Science

Test machines and facilities



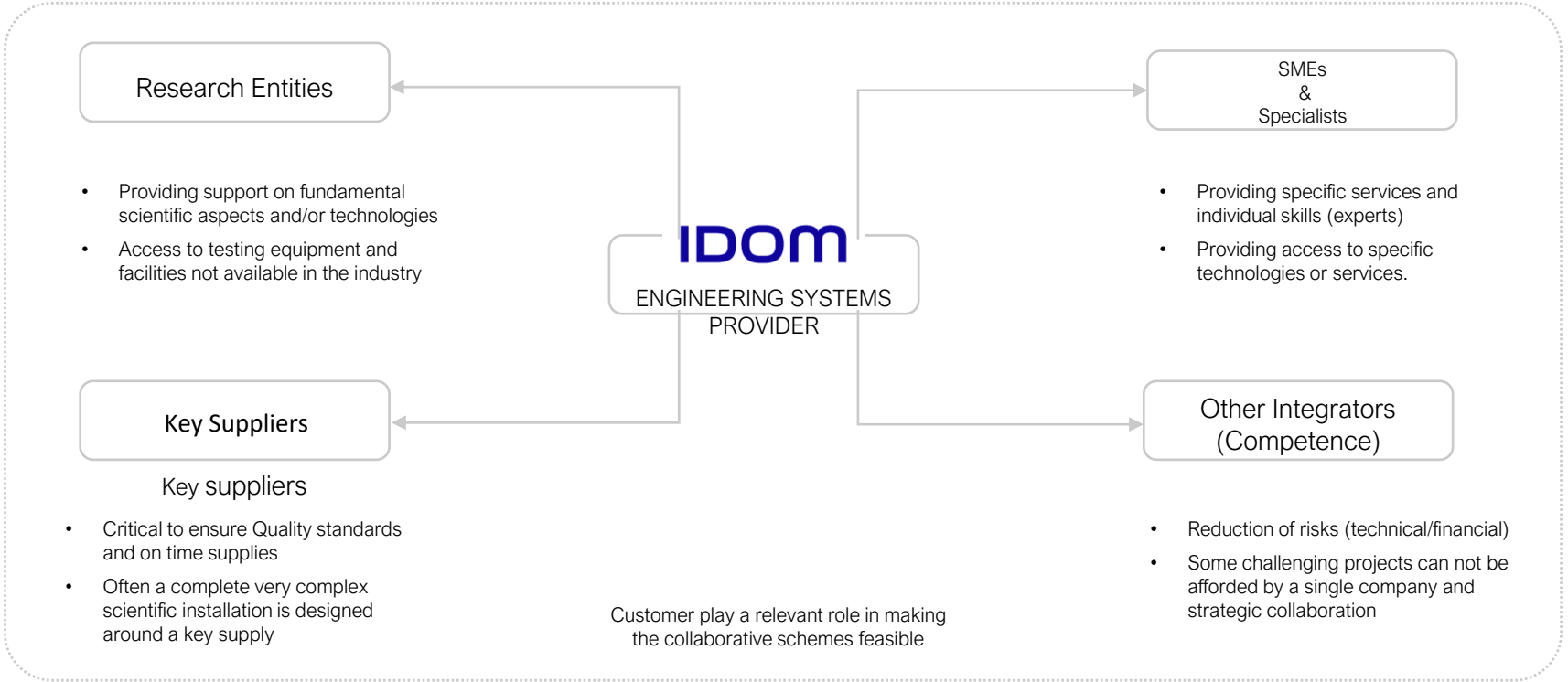
Scientific & medical instruments



Singular structures and engineering

INTEGRATOR WORKING UNDER COLLABORATIVE SCHEMES

Collaboration and teaming is **essential** in our activity. Typically any of a large engineering system provided by us will require several of the above listed collaborations



- Providing support on fundamental scientific aspects and/or technologies
- Access to testing equipment and facilities not available in the industry

- Providing specific services and individual skills (experts)
- Providing access to specific technologies or services.

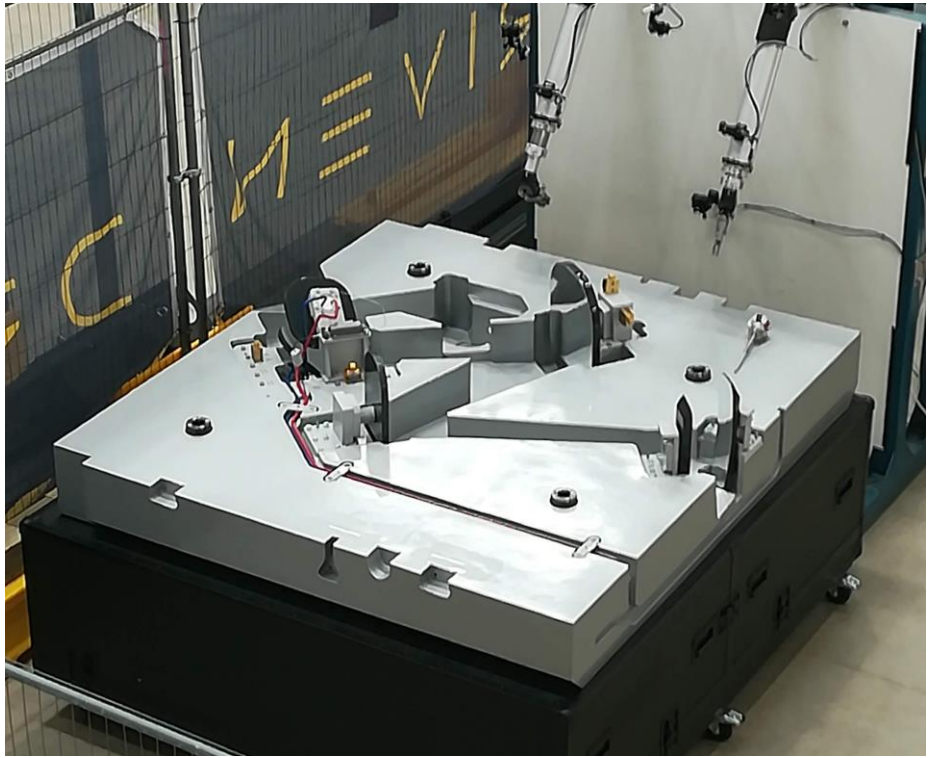
Key suppliers

- Critical to ensure Quality standards and on time supplies
- Often a complete very complex scientific installation is designed around a key supply

- Reduction of risks (technical/financial)
- Some challenging projects can not be afforded by a single company and strategic collaboration

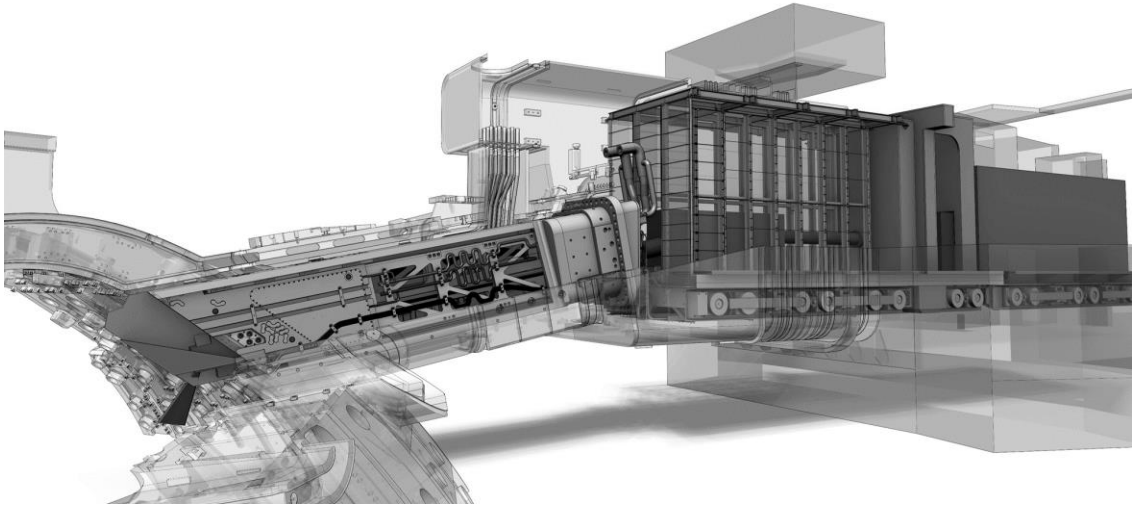
Customer play a relevant role in making the collaborative schemes feasible

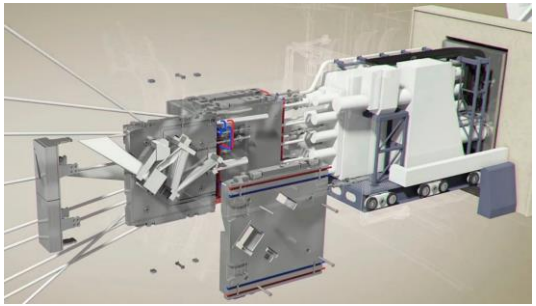
PROJECTS – ITER



Remote Handling tests on an ITER Diagnostic Shielding Module designed and built by IDOM (@ RACE, UK)

- Design and Supply of the ITER Electron-Cyclotron Upper Launchers
- **Design and Integration of ITER European Diagnostic Ports**
- Design and qualification of the Core Plasma Thompson Scattering diagnostic for ITER
- Design and qualification of ITER first confinement barrier water, gas and electrical feedthroughs.
- Design and qualification of ITER Divertor Remote Handable electrical connectors





FUSION FOR ENERGY

(FUSION REACTORS)

Design and integration of the European diagnostic ports of ITER

Large Project consisting of the design of the diagnostic ports (under the stringent rules and environment of ITER) but also integrating all the diagnostics of very different nature (optical, RF, neutronics, etc.)

Collaboration has been:

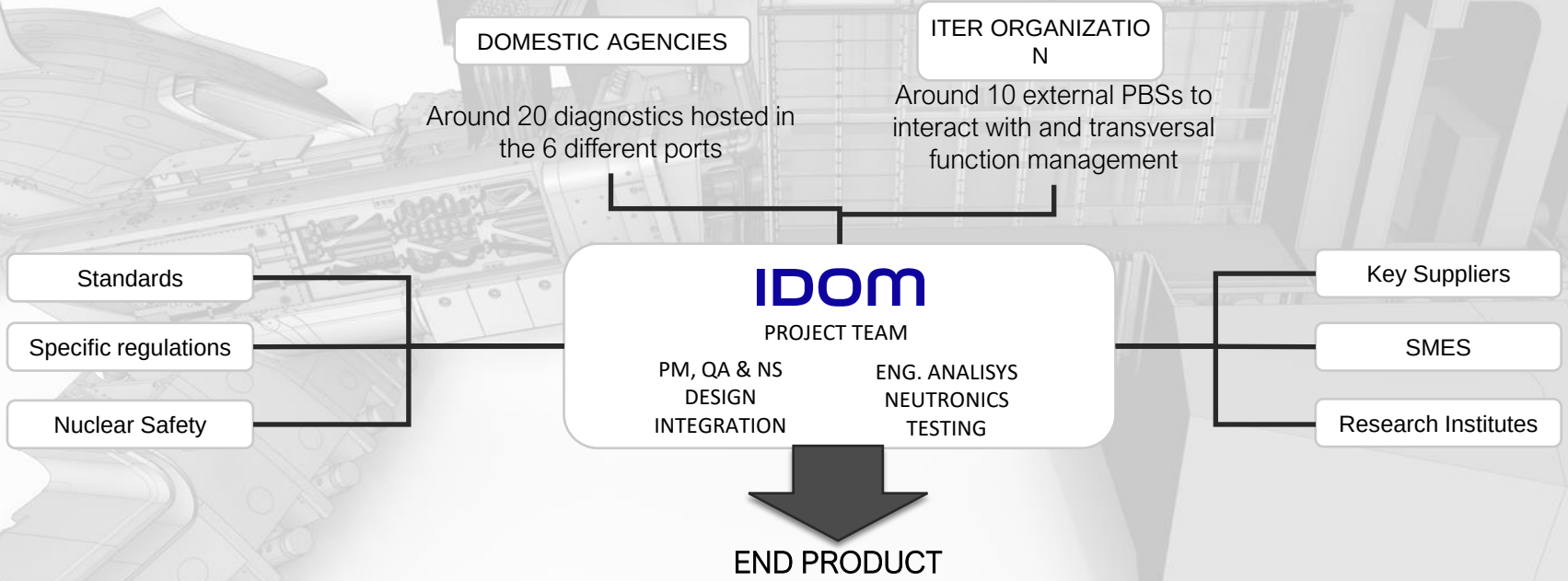
- Very intensive and extensive with the client and other stakeholders (interaction with tenants)
- Involving research institutes to assist on testing, RH activities ,etc.
- Involving specialist from the industry (SMEs) to apply different technologies and prototyping

CHALLENGES TROUGH EXAMPLES (DESIGN PHASE)

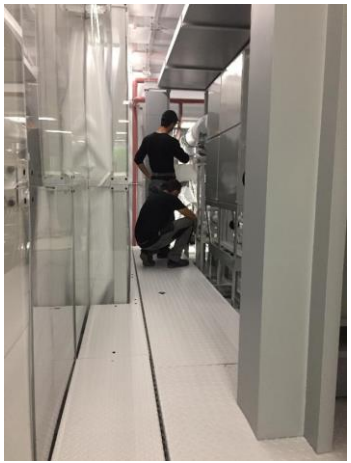
A typical system of ITER requires involvement and interaction with many stakeholders
ROBUST SYSTEMS ENGINEERING APPROACH AND COLLABORATION IS ESSENTIAL

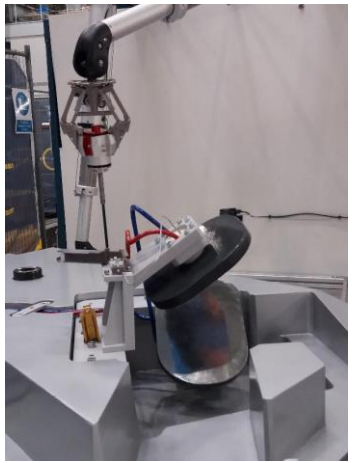
FUSION FOR ENERGY

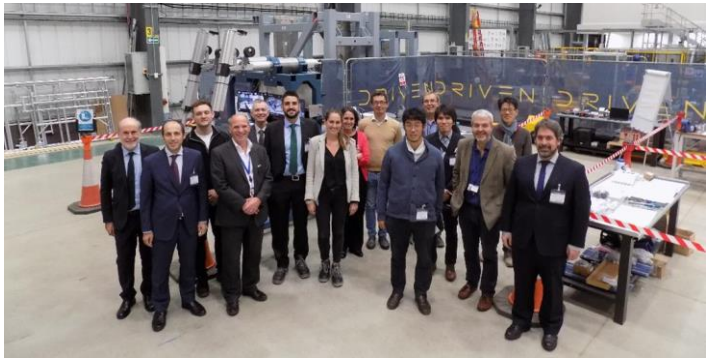
EU Diagnostic ports interaction scheme



Duration 7 years. Several hundreds of thousands of Engineering hours







Design and integration of the European diagnostic ports of ITER

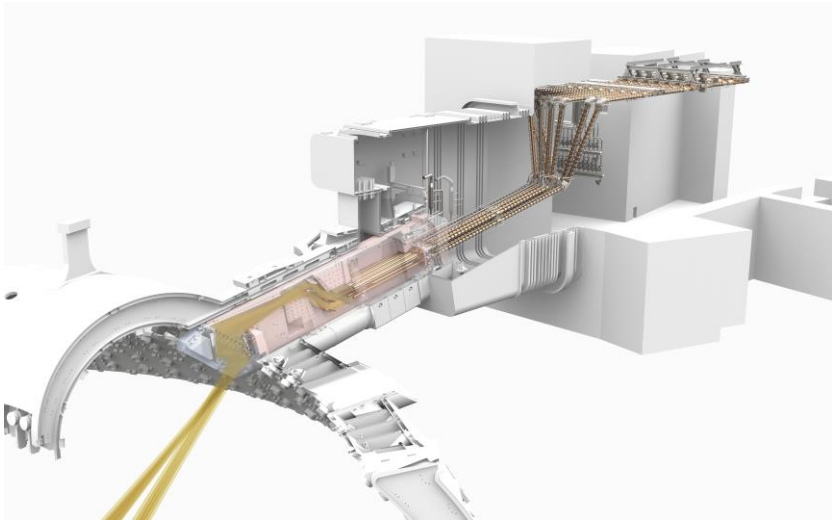
During the execution of the project IDOM has collaborate with several experts on the development of engineering:

- RH compatibility
- Eng. Analysis
- Neutronics, etc.

But the collaboration with the companies has been extended up to 20 companies on the following fields:

- Technology development:
  - Joining techniques
  - Electrical connectors development
  - Sealing components qualification
  - Etc.
- Manufacturing:
  - Complex machining
  - Process optimization
- Testing
  - R&D tests
  - Qualification tests for PIC components

PROJECTS – ITER



One of the 4 ITER Electron Cyclotron Upper Launchers

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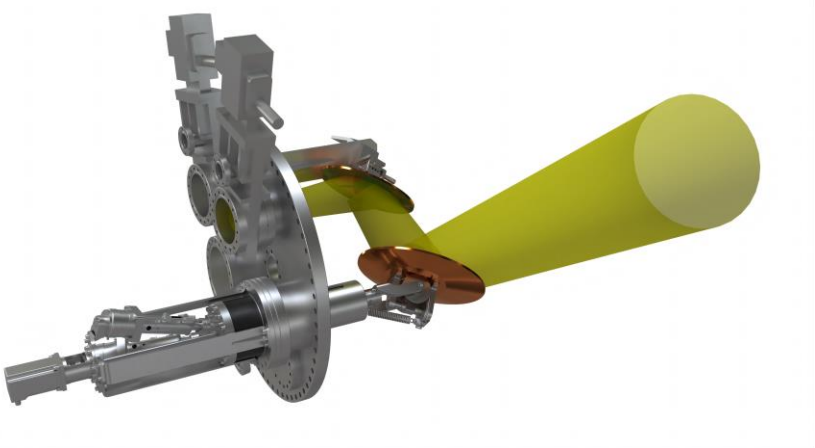
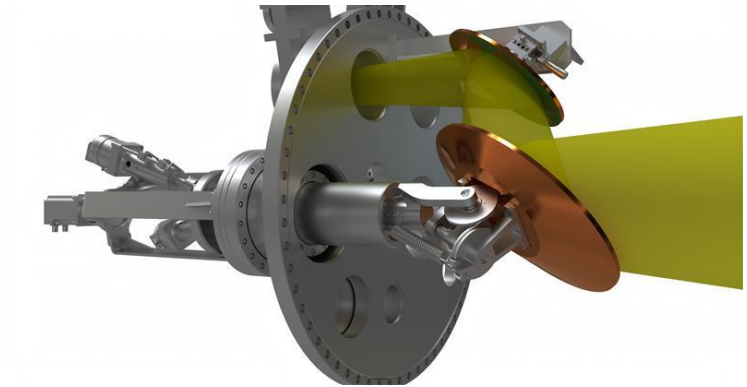
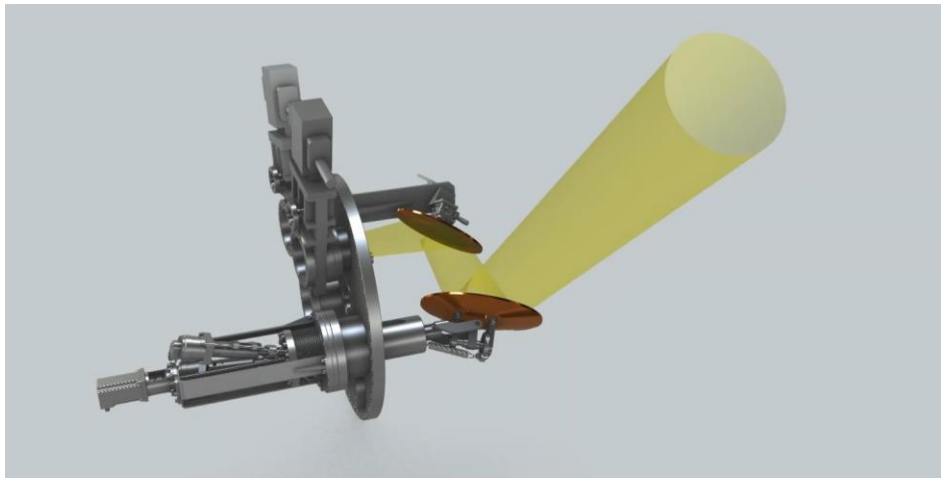
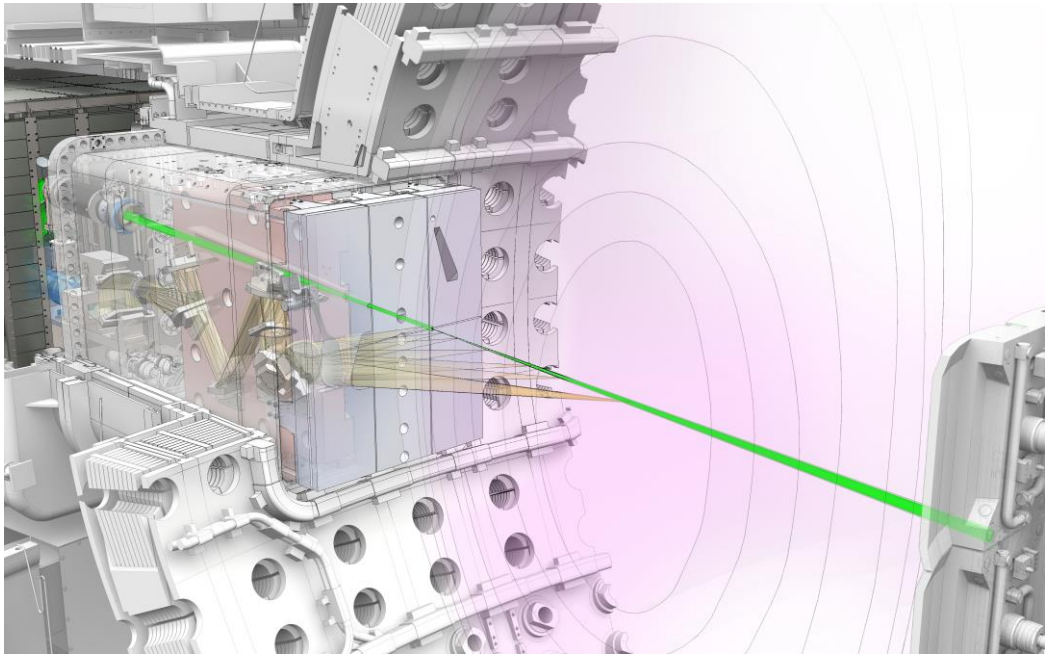
PROJECTS – MAST







PROJECTS – ITER



Laser injection and Collection Optics of the ITER Core Plasma Thomson Scattering Diagnostic

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PROJECTS – ITER

Qualifcation models of Electrical Feedthroughs for the ITER Vacuum Vessel first confinement barrier

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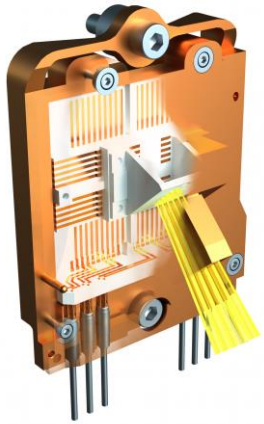
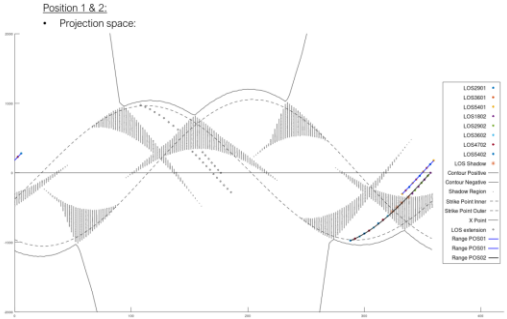
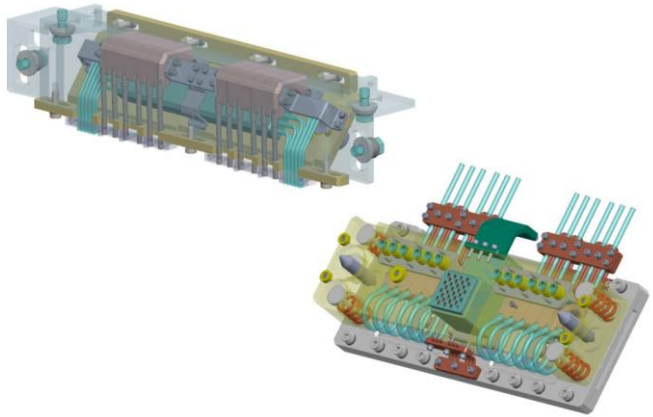
PROJECTS – ITER







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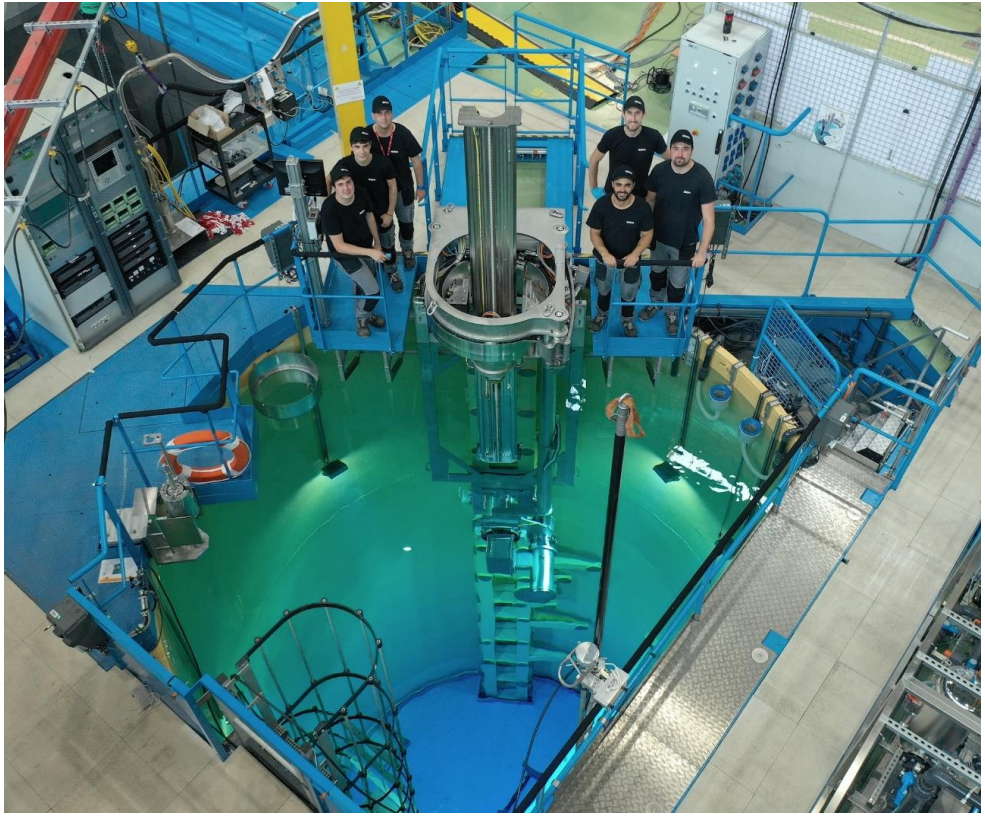
- In-vessel and Divertor bolometer cameras

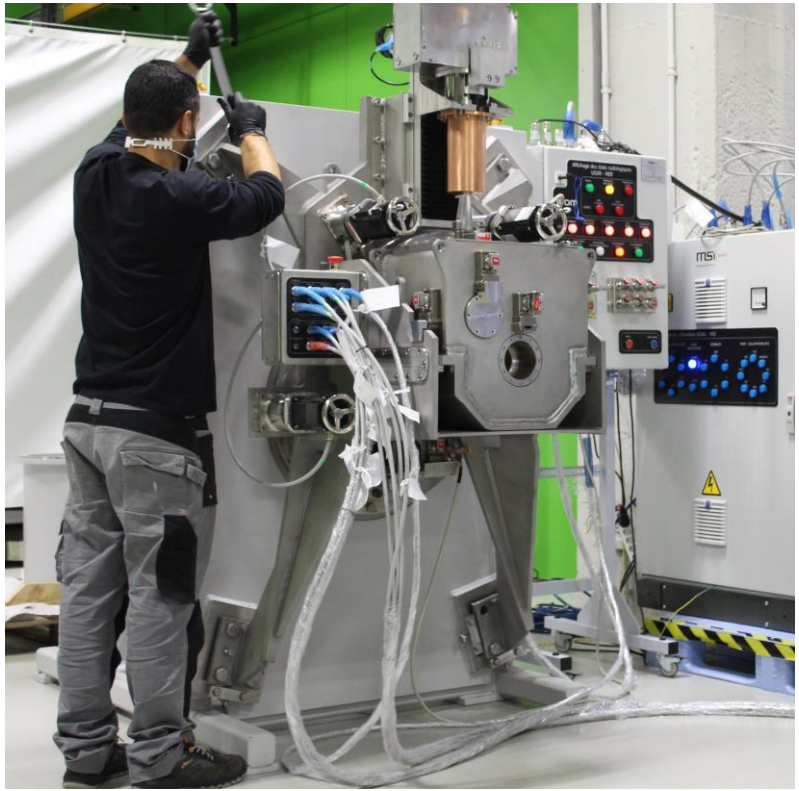
PROJECTS – NUCLEAR & PARTICLE PHYSICS



Jules Horrowitz Reactor Underwater X-Ray Tomography and Gammametry Bench
(@ TOTEM Facility, CEA, France)

- Design and supply of Underwater Gammametry and X-Ray tomography benches and collimators – JHR materials research nuclear reactor
- Design and supply of in-Hot Cell Gammametry and X-Ray tomography bench and collimators – JHR materials research nuclear reactor
- Design and supply of ESS Component Transfer Hatch
- Design and prototyping of Tungsten rotary target concepts for SNS (ORNL, US) and ESS (Europe)

PROJECTS – NUCLEAR & PARTICLE PHYSICS



Jules Horrowitz Reactor Underwater X-Ray Tomography and Gammametry Collimators
(@ IDOM Integration Hall)

- Design and supply of Underwater Gammametry and X-Ray tomography benches and collimators – JHR materials research nuclear reactor
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- Design and supply of ESS Component Transfer Hatch
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PROJECTS – NUCLEAR & PARTICLE PHYSICS

Jules Horrowitz Reactor Hot-Cell X-Ray Tomography and Gammametry Bench
(@ IDOM Integration Hall)

- Design and supply of Underwater Gammametry and X-Ray tomography benches and collimators – JHR materials research nuclear reactor
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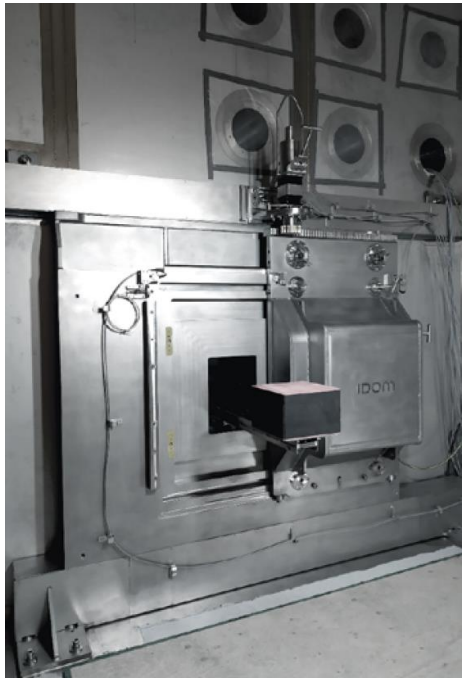
PROJECTS – NUCLEAR & PARTICLE PHYSICS



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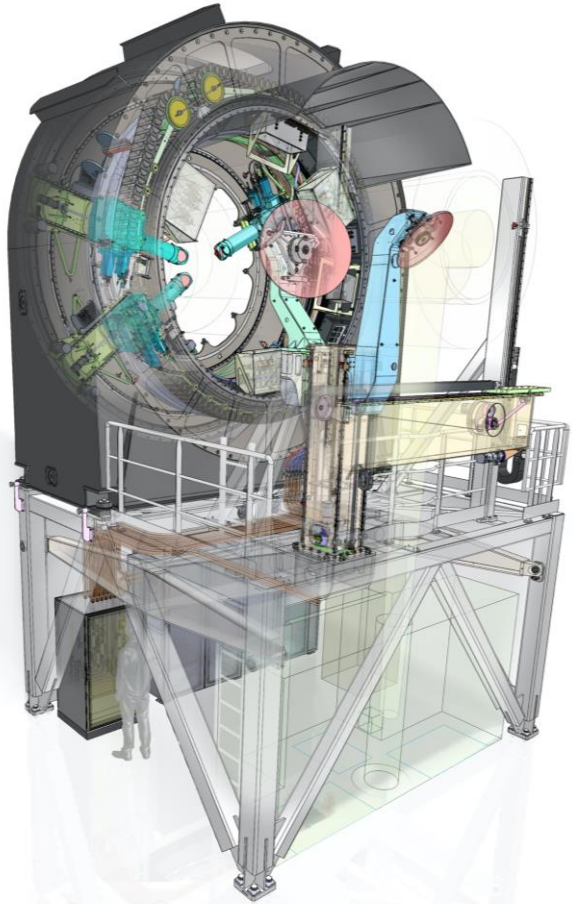
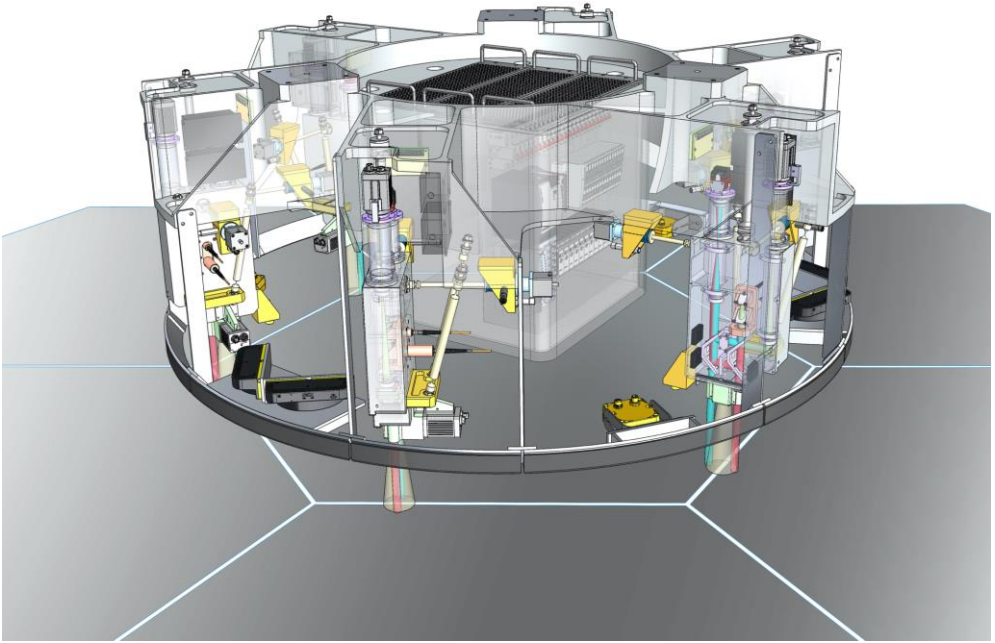
PROJECTS – ASTRONOMY



ELT Prefocal Stations: M6 mirrors, Acquisition & Guiding, and Wavefront Systems

- ELT Prefocal Stations – European Southern Observatory (ESO)
- ELT M1 Local Coherencer – European Southern Observatory (ESO)
- GTC Cassegrain Station – Gran Telescopio de Canarias
- Dynamic Optical Relay System
- European Solar Telescope (EST) Mount
- Daniel K. Inouye Solar Telescope (DKIST) enclosure – AURA, USA

PROJECTS – ASTRONOMY



Extremely Large Telescope (ELT) M1 Interferometry based Local Coherencer

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- **ELT M1 Local Coherencer – European Southern Observatory (ESO)**
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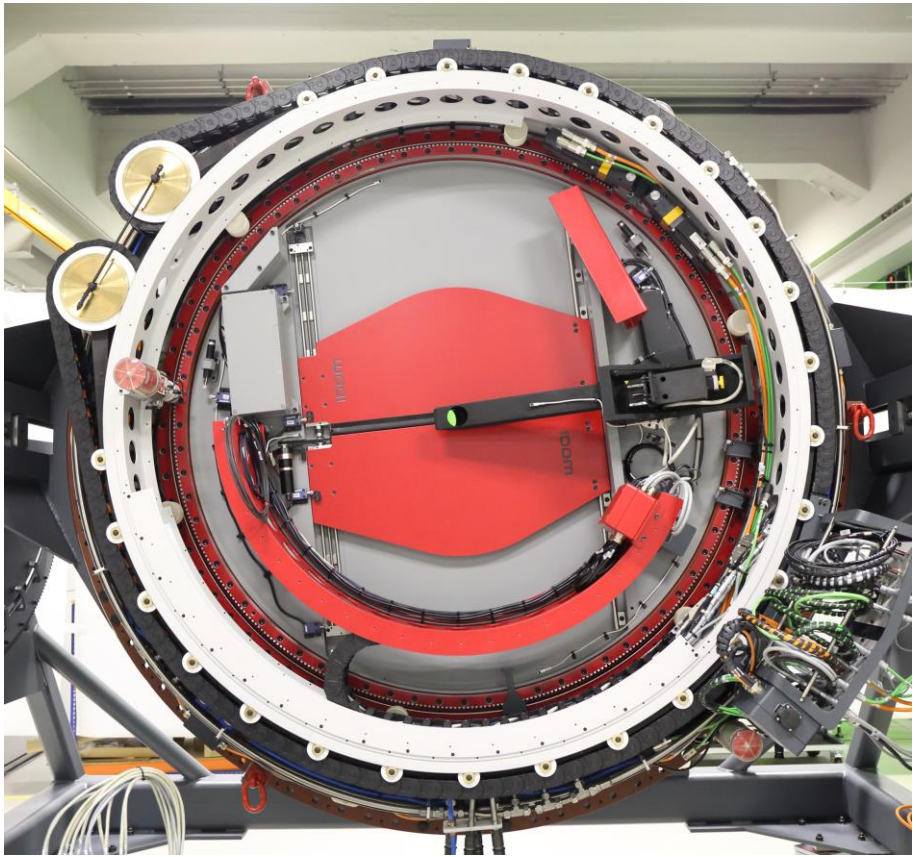
PROJECTS – ASTRONOMY



GTC Cassegrain Set: Instrument field rotator and Acquisition & Guiding System

- ELT Prefocal Stations – European Southern Observatory (ESO)
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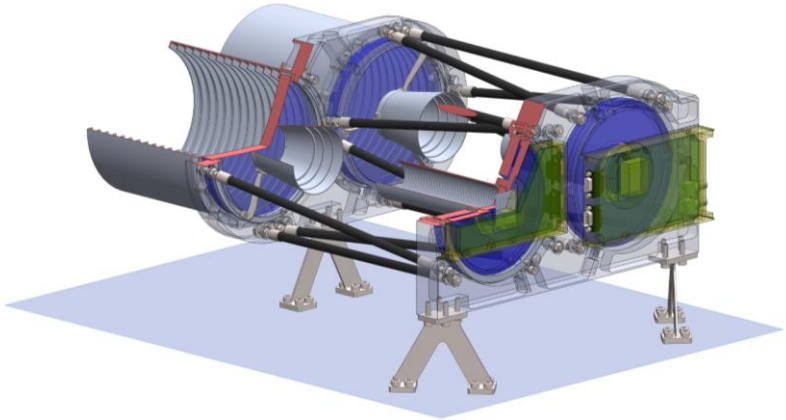
PROJECTS – SPACE



iSIM 170 Earth observing camera optical bench

- iSIM 90/170 Earth Observing Camera Optical Bench and Electronics Box – Satlantis
- Deep Sky Optical Communications Architectural Study (DOCoMAS) Ground Terminal
- Proposal for Caramuel flight segment Pointing Baseplate (PBSS) – Hispasat / Thales
- Proposal for Caramuel ground segment Optical Receiver (COR) – Hispasat / Thales

TESTING FACILITES

(RESEARCH CENTERS)

Fraunhofer DyNaLab

In this case IDOM was in charge of the complete facility including the building, civil works and the test rig (EPC).

In this case, all the facility was designed and build around a custom one-of a kind infrastructure that required specific development for this application:

- A 10 MW (500tons) motor was developed together with a German motor supplier
- An innovative 30 MVA grid simulator was implemented in collaboration with a Swiss power electronic supplier
- Other collaboration with the main fabricator and the hydraulic system company were relevant.

PROJECTS – MARINE

MARMOK-A5 OWC-WEC operating at BIMEP

- MARMOK-A5 Oscillating Water Column Weave Energy Converter - EVE
- MARMOK-A15 Oscillating Water Column Weave Energy Converter – US Department of Energy
- Current Turbines Mobile test Vessel (MTV) – Florida Atlantic University & US DoE
- Harshlab 2.0 floating offshore laboratory – Tecnalia

PROJECTS – MARINE

Current Turbines Mobile Test Vessel (MTV)

- MARMOK-A5 Oscillating Water Column Weave Energy Converter - EVE
- MARMOK-A15 Oscillating Water Column Weave Energy Converter – US Department of Energy
- Current Turbines Mobile test Vessel (MTV) – Florida Atlantic University & US DoE
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