



THE PATH TO BIG SCIENCE

MIGUEL ASTRAIN ETXEZARRETA

Max-Planck-Institute für Plasmaphysik

ASDEX Upgrade Tokamak

**Big Science
Business
Forum
2022**

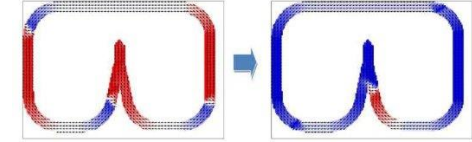


ABOUT ME




Universidad del País Vasco Physics graduate 2008-2014

- Project: **Study on spintronics. magnetic logic gates simulations**
- Visit: **ESRF and ILL in (EPN Grenoble, France)**



POLITÉCNICA

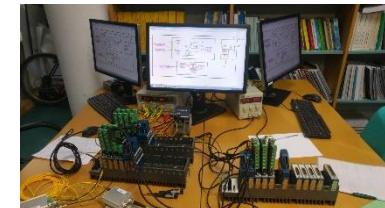
Universidad Politécnica de Madrid Electronics Engineering graduate 2014-2016

- Project: **Geiger drone**
- Visit: **TJ2 Stellarator (Ciemat Madrid, Spain)**
- **Joined the I2A2  lab at UPM**



UPM Industrial School: MSc Nuclear Science and Technology 2016-2018

- Project: **ITER fast Interlock**
- Visit: **ITER (CEA Cadarache, France)**
- Visit: **DESY (Helmholtz Hamburg, Germany)**





ABOUT ME

UPM: PhD (2018-2022)

PhD grant from Comunidad de Madrid



POLITÉCNICA



GRUPO DE INVESTIGACIÓN EN
INSTRUMENTACIÓN Y
ACÚSTICA APLICADA

“Application of OpenCL to FPGA-based systems in EPICS.

Contribution to the standardization of advanced instrumentation systems for Big Science experiments”.

Under the supervision of Professor Mariano Ruiz and Dr. Antonio Carpeño

- Driver developments for **ITER** NDS framework
- **UPM Big Science initiative** (Dr. Guillermo de Arcas)
- Push commercialization of our technology with the **UPM 2T challenge**
- Collaboration project with **JET** for the RT2020 student paper award
- Internships: System integration engineering **IFMIF** (JAP) and **HZDR ELBE** Positron Lifetime experiment (GER)
- Visited **KSTAR**, **XFEL**, **DESY**, **W7X**





ABOUT ME

Currently at IPP ASDEX Upgrade Tokamak for the development of data acquisition systems

Remarks on my path:

- I liked the science, but I **loved the technology** even more
- I had some **contacts** and projects with Big Science during my studies
- I had the **opportunity** to extend my studies to also work with several projects
- I got to know the **diverse work environments** of the field

These gave me the motivation to pursue a research career



ASDEX UPGRADE

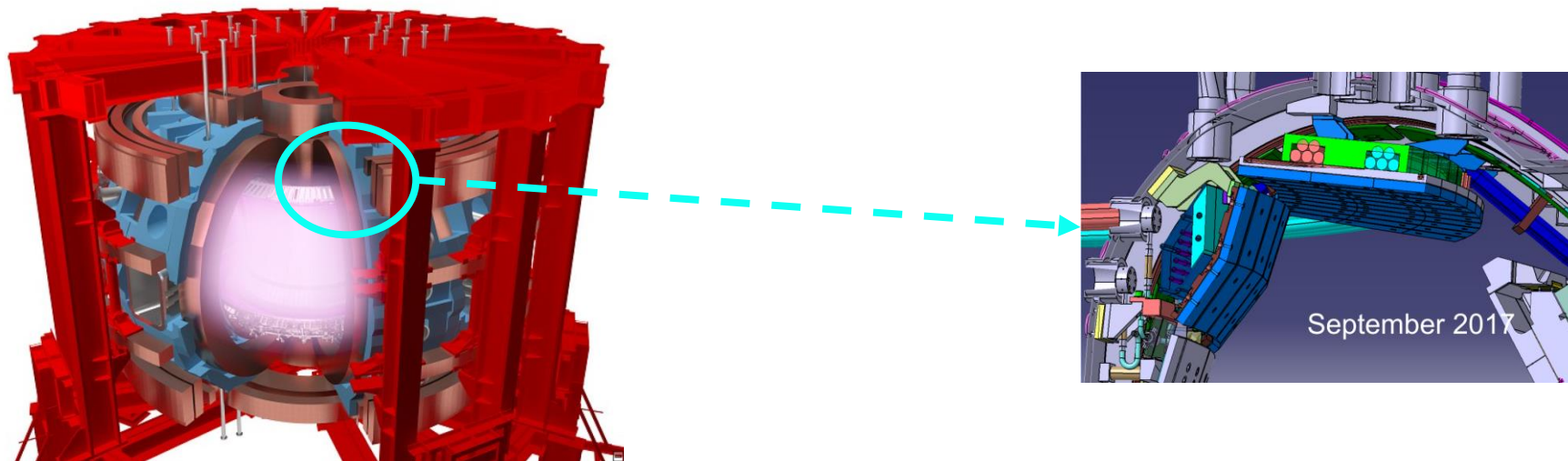
More than 30 years of operation

Diverse environments from software to hardware

Currently (2022-2024) being upgraded to include an upper divertor

Also looking for experts in data acquisition, data management and system integration

Suitable profiles range from physics, computer science to electronics, with strong programming skills





DISCUSSION TOPICS

For the discussion, is enough done in....

- 1. Promotion of multidisciplinary/technologist profiles in Big Science during the whole lifetime of the facility?**
- 2. Attraction of engineering students to this sector and motivate them to stay?**
- 3. Training of students in the wide range of hardware and software systems that are needed in Big Science?**
- 4. Maintaining a healthier structure of engineering students in Big Science?**
- 5. Offering a competitive alternative to the industry in the search of new expertise?**



THANK YOU

Miguel Astrain Etxezarreta

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