



EPFL-ACH

Pr. Paolo Ricci (Academic Director & PI)

Dr. Gilles Fourestey (Operations Director)



EPFL-ACH in a nutshell



Support center for HPC applications and provider of advanced computing platforms (~35 people)

Experiment a
Museology
+

Virtual, augmented, mixed reality, through advanced computer science and state-of-the-art visualization facilities (~10 people)



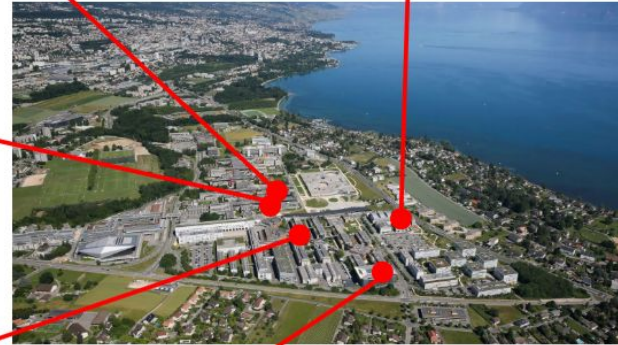
Computational Science and Engineering Mathematics group (~70 people)



Swiss Data Science Center, national institute for artificial intelligence and machine learning techniques (~50 people)

EPFL
Swiss
Plasma
Center

(~ 200 people,
theory group:
~ 40 people)





A comprehensive support, from HPC code design to visualization

We are a competence center for

- methods, providing specific support to specific needs
- applications, developing and maintaining EUROfusion software

DESIGN

IMPLEMENTATION

TESTING

VISUALIZATION

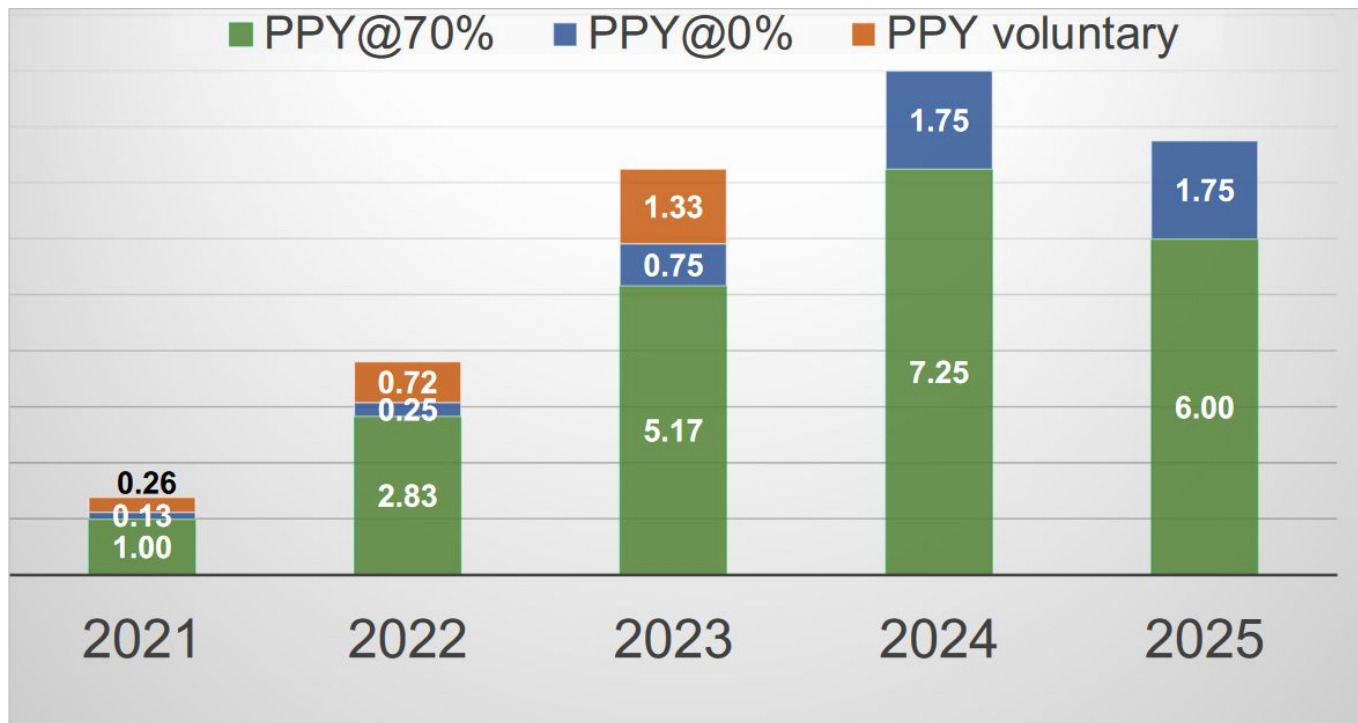


... to an even larger involvement





Large voluntary contribution





- 21 Projects over 5 years
- TSVV-01, 02, 03, 04, 06, 09, 10, 11, 12, 13, 15

Projects scope:

- GPU porting/portability
- Solver optimization (Sparse linear algebra)
- Profiling
- General optimization (vectorization, threading...)
- Parallelization (MPI)
- Visualization

- ASCOT5
- CAS3D
- DEFUSE
- EFRDT (outreach)
- EUTERPE
- FELTOR
- GBS
- Free Boundary EQ
- GENE
- GENE-3D
- GENE-X
- ORB5
- GRILLIX
- GYACOMO
- GYSELA
- HeLaZ
- HYMAGYC
- JOREK
- MEQ
- SOLEDGE3X
- SPEC

EPFL EUROfusion calls



Fusion Digital Twin proposal - 2026+:

- Provide a DT for divertors in TCV in Nvidia Omniverse
- Collaboration between **SPC, SCITAS**
- **Nvidia as official partner**

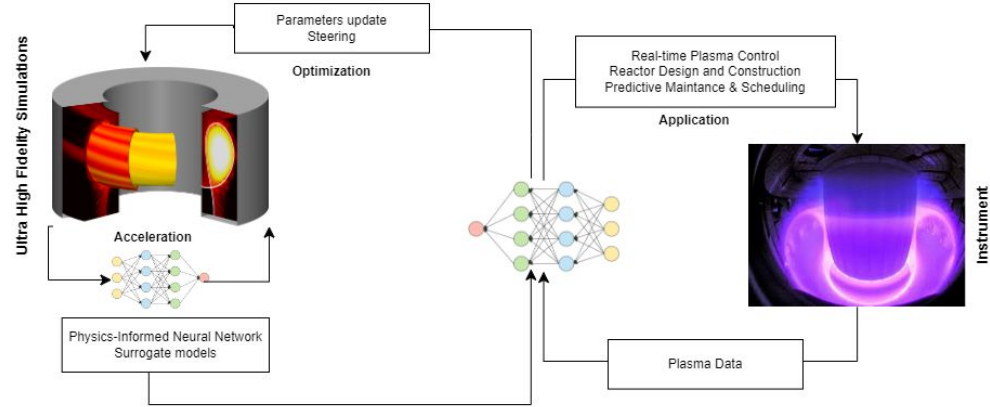
Courses in 2025:

- Parallel Programming - Single-core optimization, MPI, OpenMP, and hybrid programming
- Parallel and high-performance computing

Courses in 2026:

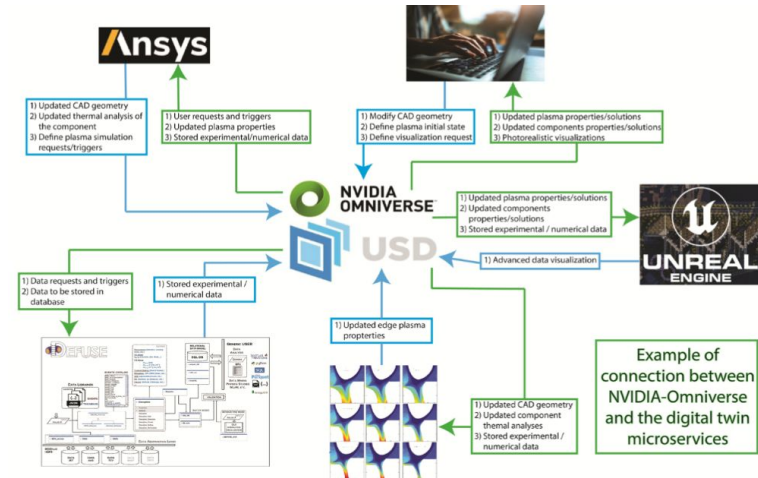
- High-Performance Python for Scientists
- Scientific Software Design: Best practices for writing robust and maintainable code

Fusion Digital Twin



Training

Inference



**9:30 AM** → 9:35 AM **Welcome - Paolo Ricci ACH-EPFL**

⌚ 5m

 01. Paolo Ricci_Wel...**9:35 AM** → 9:45 AM **Report of Team Leader ACH-EPFL - Gilles Fourestey**

⌚ 10m

9:45 AM → 11:25 AM **Reports from ACH-EPFL members (Chair: Gilles Fourestey)****9:45 AM****Mathieu Peybernes - Directive-Based GPU Porting of SOLEDGE3X**

⌚ 25m

 03. Mathieu Peyber...**10:10 AM****Emily Bourne - Gyselalib++: A Portable, Kokkos-Based Library for Exascale Gyrokinetic Simulations**

⌚ 25m

 04. Emily Bourne_G...**10:35 AM****Cristian Sommariva - Cray's Inferno: a voyage through the porting of the JOEREK code on LUMI-C**

⌚ 25m

11:00 AM**Alessandro Mari - Towards more efficient solvers for LIUQUE reconstruction**

⌚ 25m

 06. Alessandro Mari...**11:25 AM** → 11:55 AM**Break**

⌚ 30m

11:55 AM → 1:35 PM **Reports from ACH-EPFL members (Chair: Gilles Fourestey)****11:55 AM****Nicola Varini - Progress report on GBS,GRILLIX and FELTOR**

⌚ 25m

 07. Nicola Varini.pdf**12:20 PM****Florian Cabot - Updates on Visualization Tools**

⌚ 25m

12:45 PM**Piyush Panchal - Parallel IO in GENEX using ADIOS**

⌚ 25m

1:10 PM**Emmanuel Lanti - From SPEC to SP(OC | ECTRE): breathing Pythonic life into a legacy Fortran code**

⌚ 25m

 10. Emmanuel Lanti...**1:35 PM** → 2:35 PM**Lunch**

⌚ 1h



1:35 PM → 2:35 PM

Lunch

🕒 1h

2:35 PM → 2:45 PM

Report of Team Leader ACH-BSC/CIEMAT - Alejandro Soba

🕒 10m

 11. CIEMAT-BSC_AC...

2:45 PM → 4:00 PM

Reports from ACH-BSC/CIEMAT members (Chair - Alejandro Soba)

2:45 PM

Gaurav Saxena & David Vicente Dorca - Hybrid Parallelization in SOLPS-ITER (remote)

🕒 25m

 12. Gaurav Saxena-...

3:10 PM

Alejandro Soba - Work done over GENEX, SPEC, SPICE2 and Alya codes in the CIEMAT-BSC ACH

🕒 25m

 13. Alejandro Soba_...

3:35 PM

Federico Cipolletta - Solving the generalized eigenvalue problem in the JOREK free boundary and resistive wall extension: a progress report from the CIEMAT-BSC ACH about the assessment of using ELPA

🕒 25m

 14. Federico Cipolle...

4:00 PM → 4:20 PM

Break

🕒 20m

4:20 PM → 5:45 PM

Reports from ACH-BSC/CIEMAT members (Chair - Alejandro Soba)

4:20 PM

Xavier Saez - Status of BIT1 Porting to GPU and Progress on X-tork

🕒 25m

 15. Xavier Saez_3rd...

4:45 PM

Joan Vinyals - Analysis and optimization memory requirements for STELLA (and) Continuous performance monitoring for GVEC

🕒 25m

5:10 PM

Augusto Maidana - GPU Acceleration of ERO 2.0 for Advanced Plasma-Wall Interaction Studies

🕒 25m

6:30 PM → 9:00 PM

Meeting Dinner (departure from the Hotel, walking distance)

🕒 2h 30m

📍 Restaurant l'Abordage



9:00 AM → 9:10 AM	Report of Team Leader ACH-MPG - Roman Hatzky (remote)	🕒 10m
	18. Roman Hatzky_...	
9:10 AM → 10:50 AM	Reports from ACH-MPG members (Chair: Roman Hatzky)	
9:10 AM	Huw Leggate - Consolidating ORB5 bsplines with the SPCLibs library	🕒 25m
9:35 AM	Max Lindqvist - Progress report on STRUPHY and GENE	🕒 25m
	20. Max Lindqvist_A...	
10:00 AM	Serhiy Mochalsky - Benchmarks and validation of the Pitagora HPC system	🕒 25m
	21. Serhiy Mochalsk...	
10:25 AM	Tiago Ribeiro - Multi regions-of-interest (ROI) in REFMUL3	🕒 25m
	22. Tiago Ribeiro_ac...	
10:50 AM → 11:10 AM	Break	🕒 20m
11:10 AM → 11:20 AM	Reports of Team ACH-VTT - Oskar Lappi & Ville-Markus Yli-Suutala	🕒 10m
11:20 AM → 12:10 PM	Reports from ACH-VTT members	
11:20 AM	Oskar Lappi - Scalable Domain-decomposed Monte Carlo Neutral Transport for Nuclear Fusion	🕒 25m
	24. Oskar Lappi.pdf	
11:45 AM	Ville-Markus Yli-Suutala - Performance Measurement of Offloaded OpenMP Kernels on AMD GPUs	🕒 25m
	25. Ville-Markus Yli-...	
12:10 PM → 1:00 PM	Lunch	🕒 50m
1:00 PM → 1:05 PM	Move to SPC	🕒 5m
1:05 PM → 1:50 PM	Tokamak visit in SPC (Swiss Plasma Center)	🕒 45m
1:50 PM → 2:00 PM	Move to Data Center CCT	🕒 10m
2:00 PM → 2:45 PM	Data Center CCT visit	🕒 45m
2:45 PM → 2:55 PM	Move to Starling Hotel	🕒 10m
2:55 PM → 4:00 PM	Discussions - General topics	🕒 1h 5m
4:00 PM → 4:05 PM	End of the meeting	🕒 5m