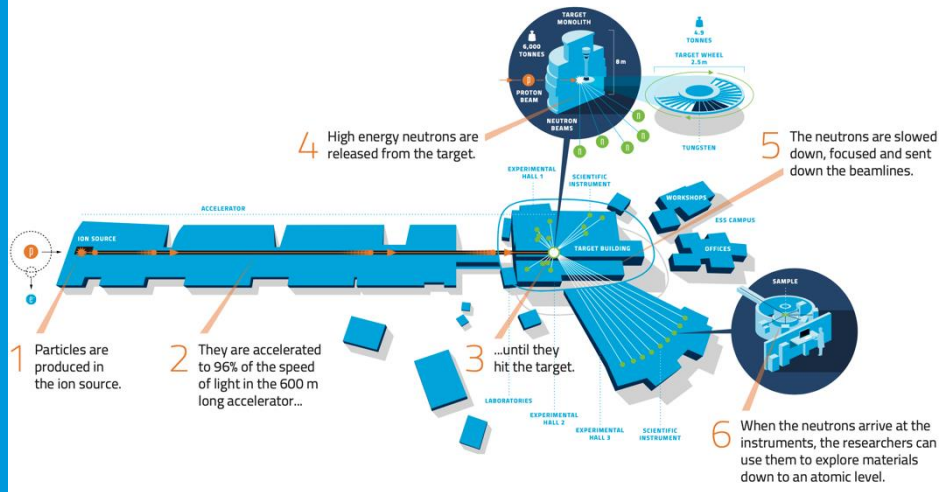
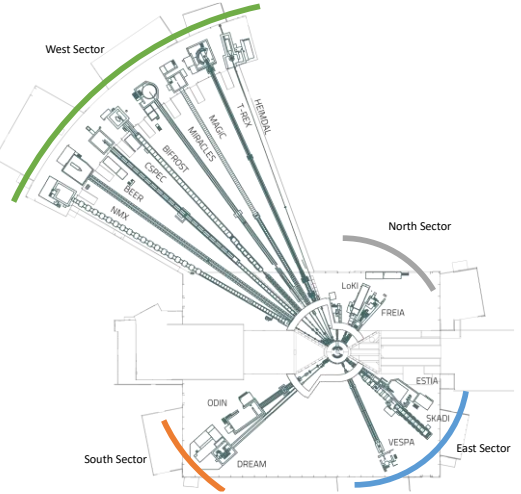
2003	2009	2010	2013	2014	2015	2022	2024	2025	2026	2027	2028
The first concept design is finalised	Decision to site ESS in Lund (Sweden) and its DMSC – Data Management and Software Centre in Copenhagen (Denmark)	ESS becomes ESS AB, a publicly held company with 75% of its stock held by Sweden and 25% by Denmark.	ESS Technical Design Report completed	Start of construction of the ESS site, Lund	ESS becomes a European Research Infrastructure Consortium (ERIC)	Civil construction in Lund completed	Accelerator completed	First neutrons – the first proton beam strikes the target	First scientific experiments	End of the current phase of the construction project and start of operations	

European Spallation Source update

GIOVANNA FRAGNETO – STAPS APR - 2026





Introduction

Progress…not without challenges

The whole Project is converging towards our major milestones, but challenges continue

→Power event/moderator reflector plug damage

Beam on Target is delayed however work continues:

- Optimise planning for 2026 and 2027
- Bunker access for the whole of 2026
- ACC testing to dump
- Target integrated testing
- Acceleration of instrument installations
- Operational readiness

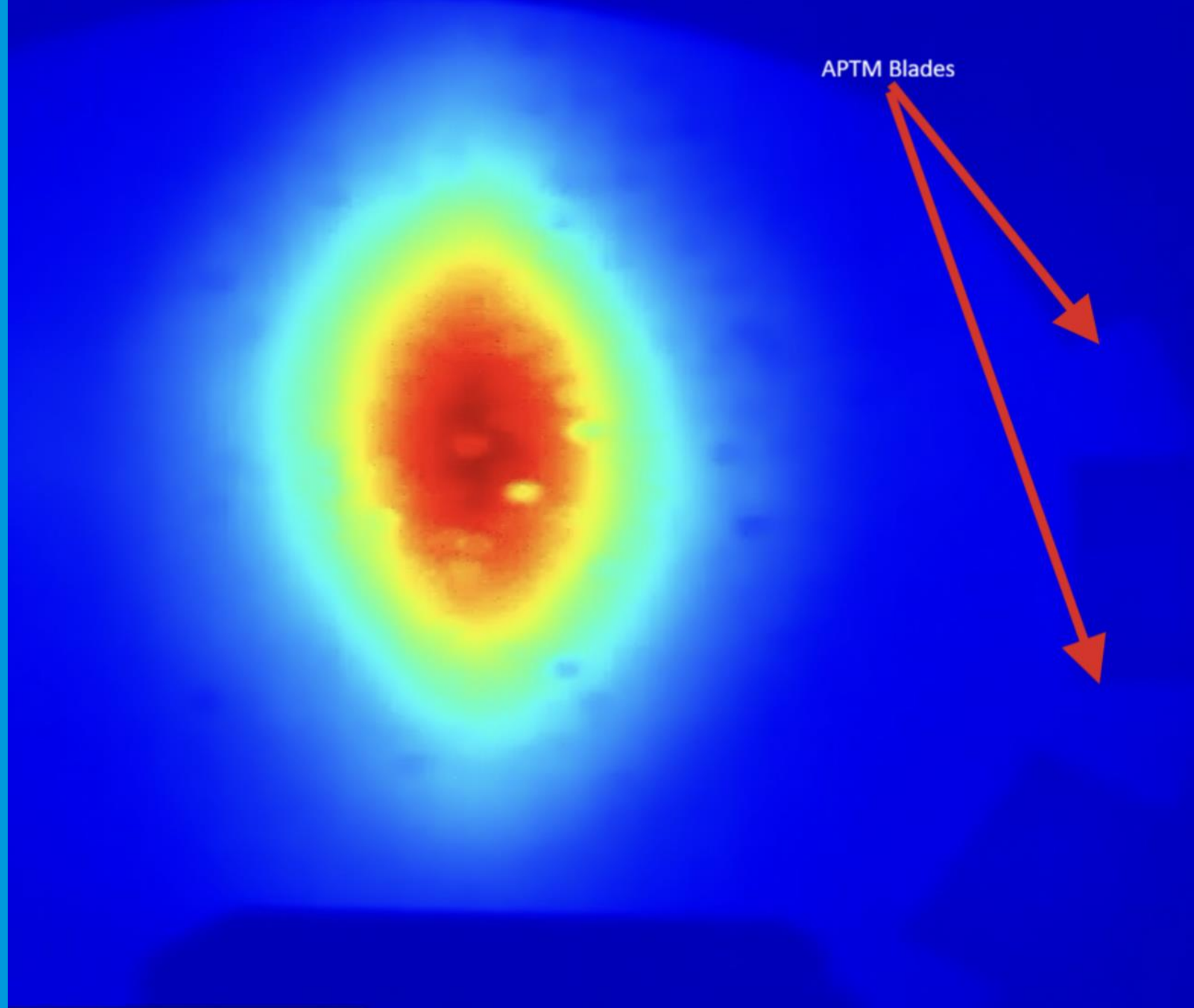
This is not the time to slow down

2025 Week 35: 27+6 CMs in place extending the accelerator capability. Preparations underway to complete connections, cooldown and resume commissioning to dump, then to target.

Accelerator

BoD2 campaign underway

Beam through SCL
LLRF optimisation
RF commissioning



Target

- Integrated tests: Target wheel rotation with HRU and helium circulator (last week: 24/7)
- CMS warm-up after cold run
- Cask 4 (TW) FAT done

Controls

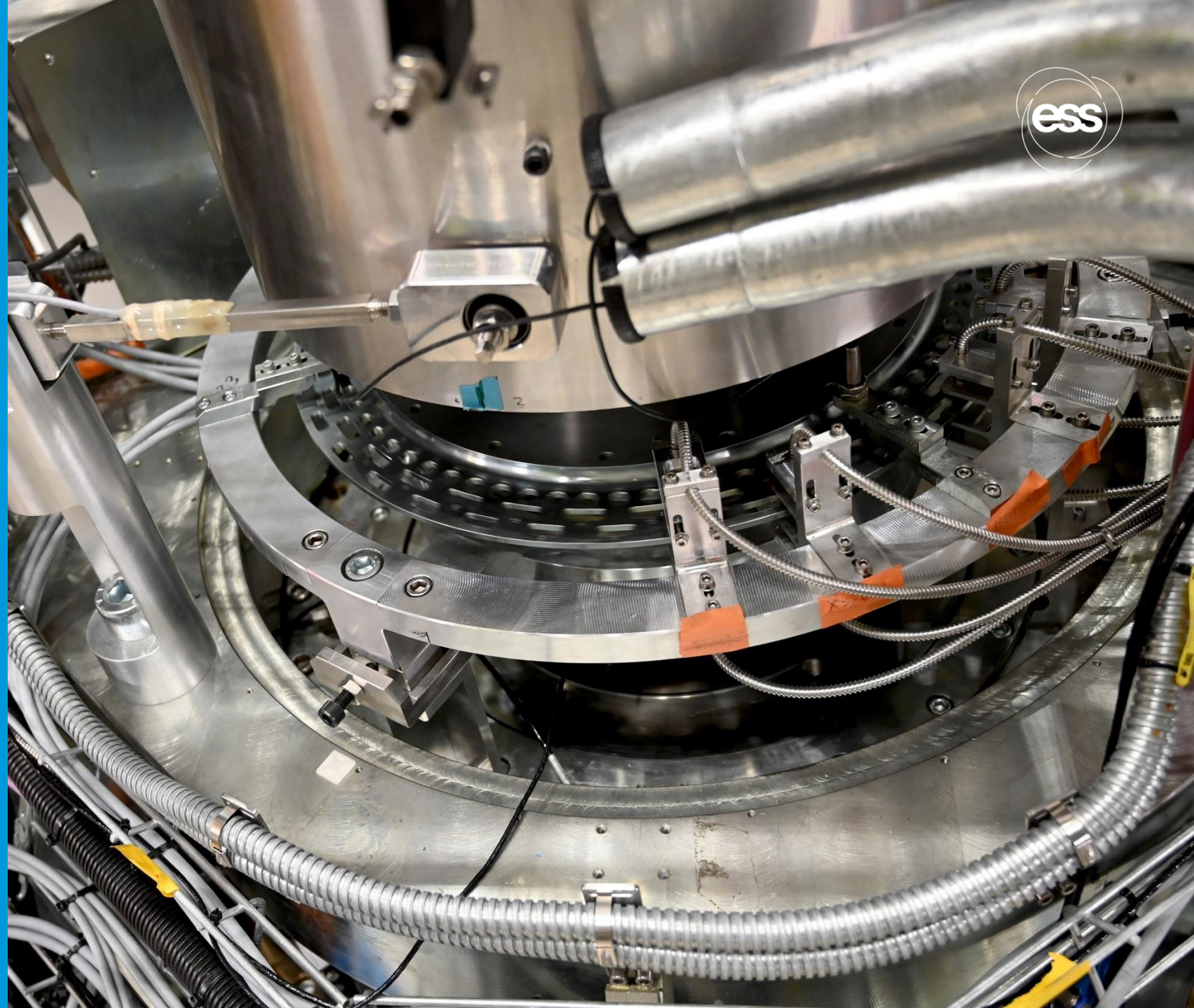
Target system controls in integrated testing

Modulator control upgrade

Beam diagnostics connected to MPS

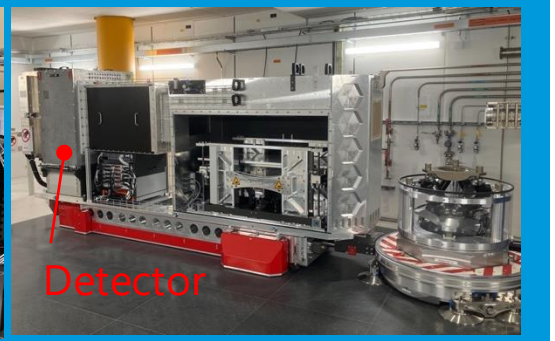
PSS for BEER, MAGIC, SKADI

Infrastructure for several instruments (CSPEC, FREIA, MAGIC, BEER)

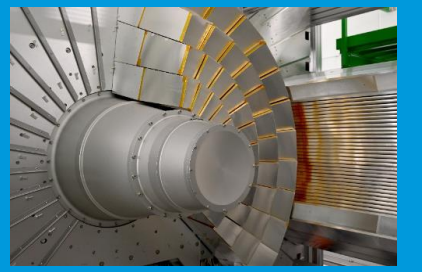


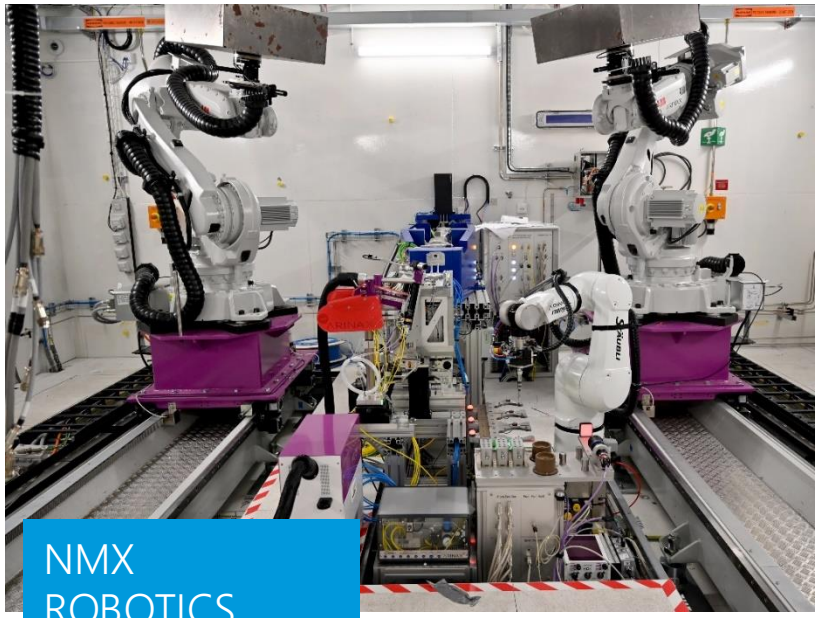
Instruments

- CSPEC – neutron guide installation (E02)
- DREAM – iSRR coming up
- FREIA – cave internal works, goods lift
- NMX – Robotics tests continue
- BEER – cave internal works, chopper pit works (D03)
- T-REX – cave walls and chicane
- ESTIA – detector test with radsource



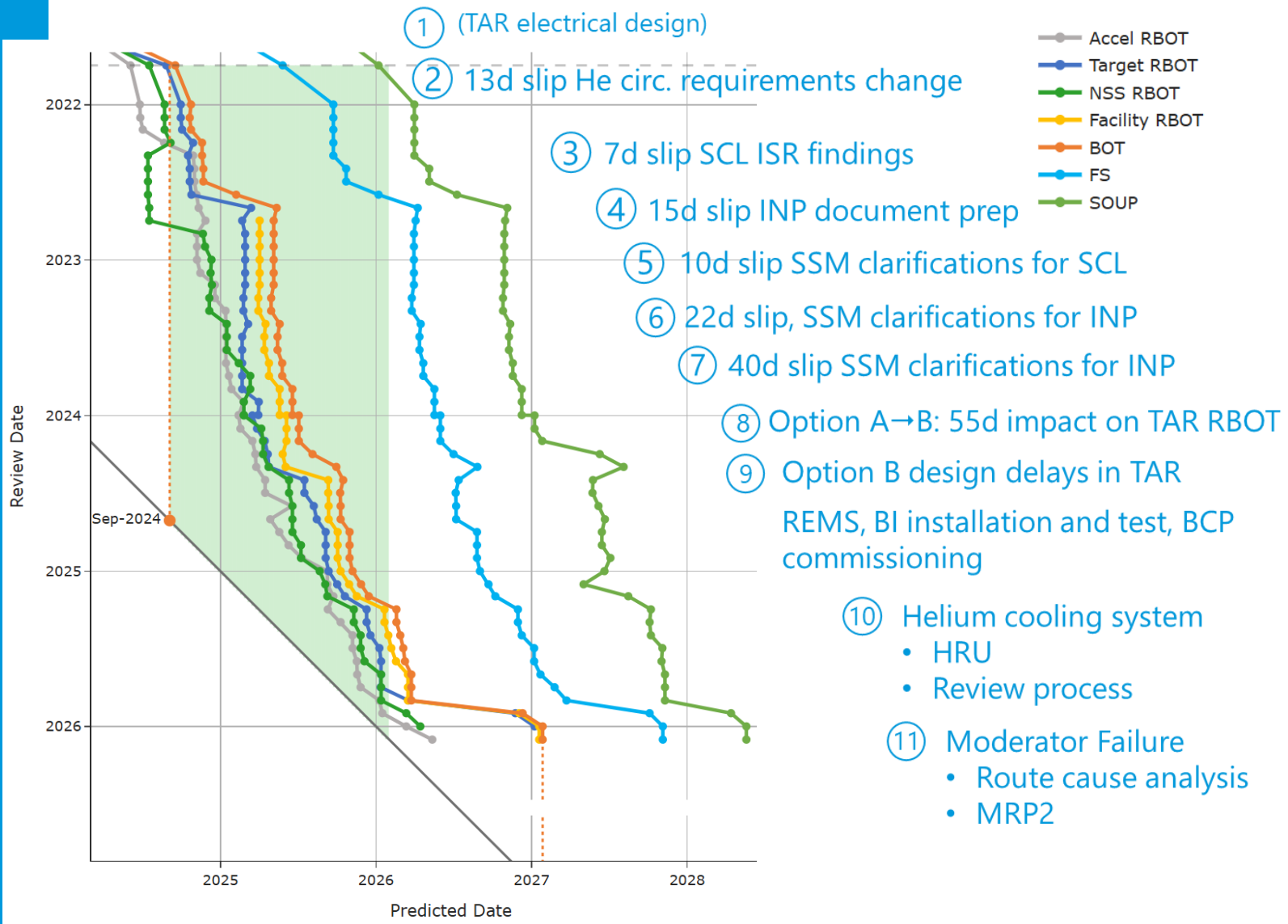
ESTIA & DREAM DETECTORS





Schedule and current status

Project Update (February data)



1. (TAR electrical design)
2. 13d slip He circ. requirements change
3. 7d slip SCL ISR findings
4. 15d slip INP document prep
5. 10d slip SSM clarifications for SCL
6. 22d slip, SSM clarifications for INP
7. 40d slip SSM clarifications for INP
8. Option A→B: 55d impact on TAR RBOT
9. Option B design delays in TAR

   REMS, BI installation and test, BCP commissioning
10. Helium cooling system
    - HRU
    - Review process
11. Moderator Failure
    - Route cause analysis
    - MRP2

Key dates

Beam on Dump: ✓

SAR5: 30th June 2026

SRR5: 8th September 2026

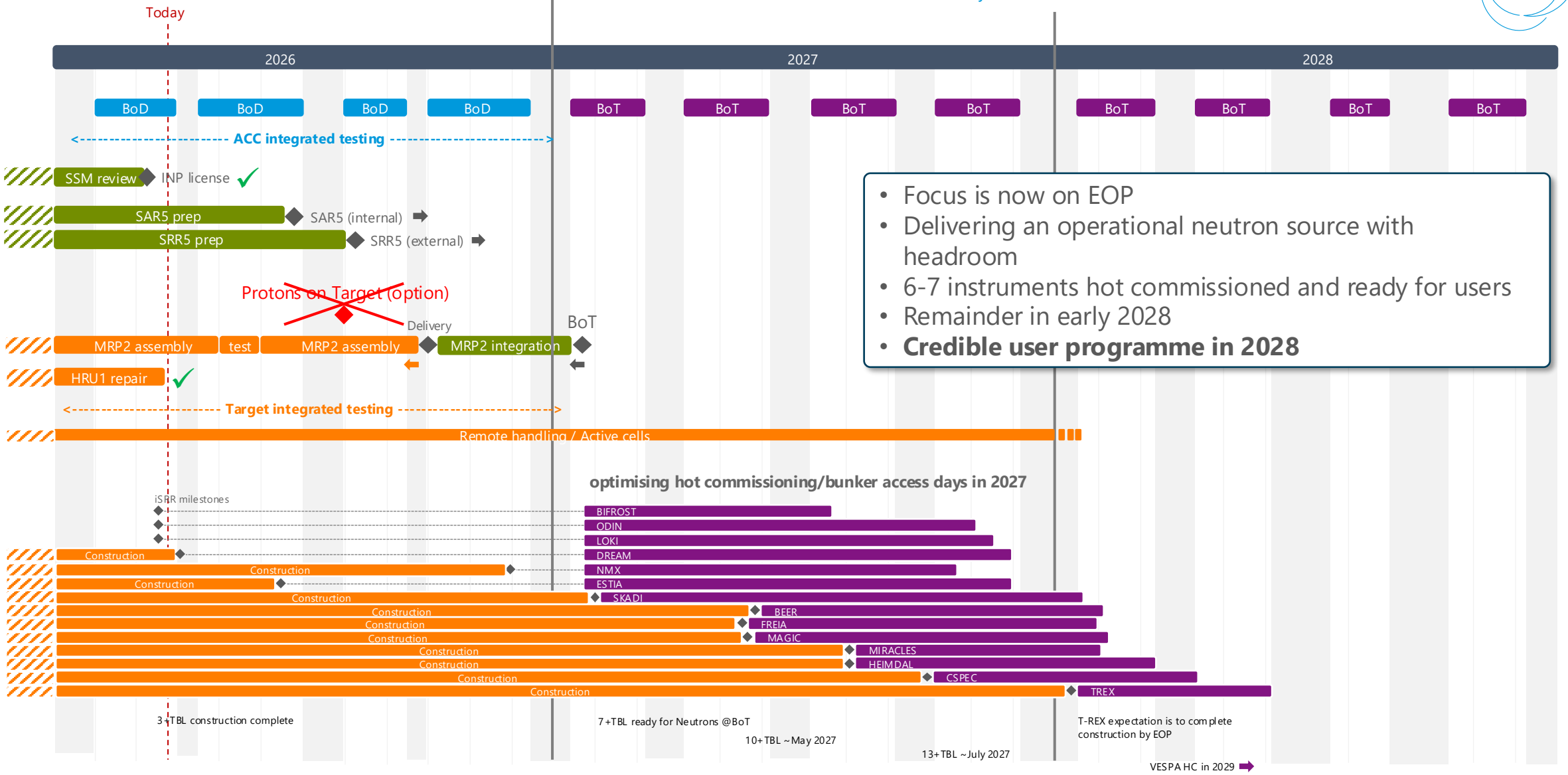
Facility RBOT: 19th January 2027 following MRP2 Assembly and testing

Beam on Target: 27th January 2027

Date held from last month, driven by delivery date of MRP2, 15th October 2026

Project overview

End of project:
2MW+ capable accelerator
Goal of demonstrating ~500kW proton beam power
6-7 instruments ready for users



- Focus is now on EOP
- Delivering an operational neutron source with headroom
- 6-7 instruments hot commissioned and ready for users
- Remainder in early 2028
- **Credible user programme in 2028**

A closer look to instruments and science...

LoKI, ODIN, BIFROST, TBL completed construction

iSRRs successfully carried out in December 2025. Three more in Spring 2026

LoKI

ODIN

BIFROST

TEST BEAMLINE

Science & Technology Facilities Council

Technische Universität München

PAUL SCHERRER INSTITUT PSI

DTU

EUROPEAN SPALLATION SOURCE

IFE Institute for Energy Technology

PAUL SCHERRER INSTITUT PSI

Four instruments ready for neutrons - a major step on the ESS Road to Science.

Thank you to all ESS staff that did not make it to the pictures!

Celebration during ICB meeting on 3rd March

DREAM TG5 25th March 2026


System Acceptance & Instrument Safety Readiness Reviews Meeting for DREAM

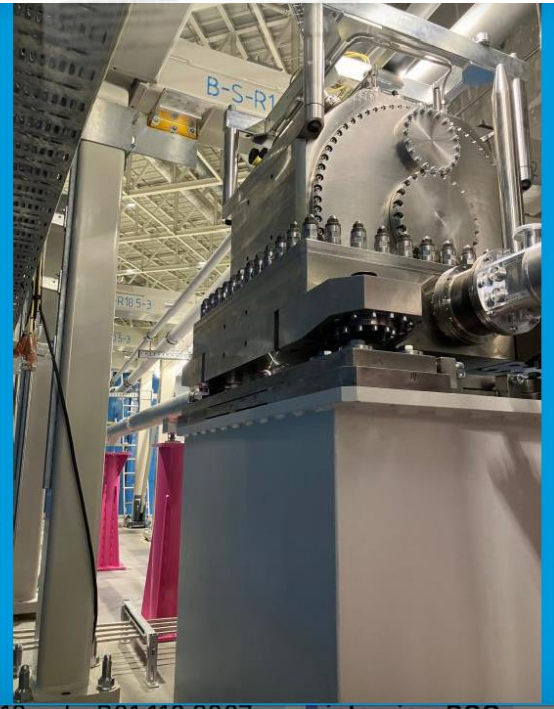
Agenda

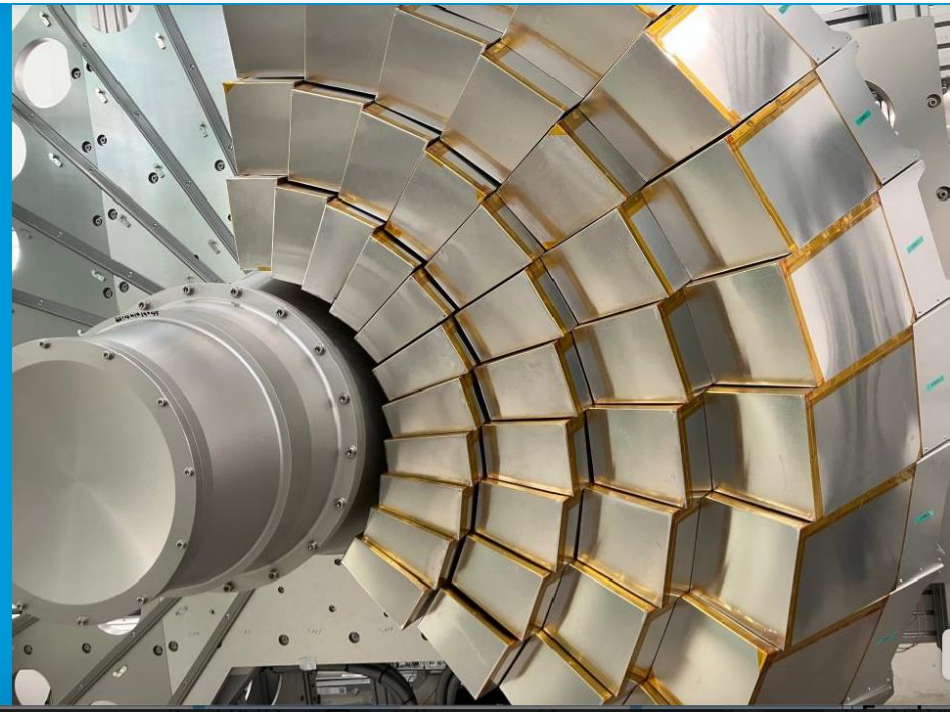

System Acceptance Review

Instrument Safety Readiness Review


Site Visit & Instrument Safety Systems Demonstration for DREAM

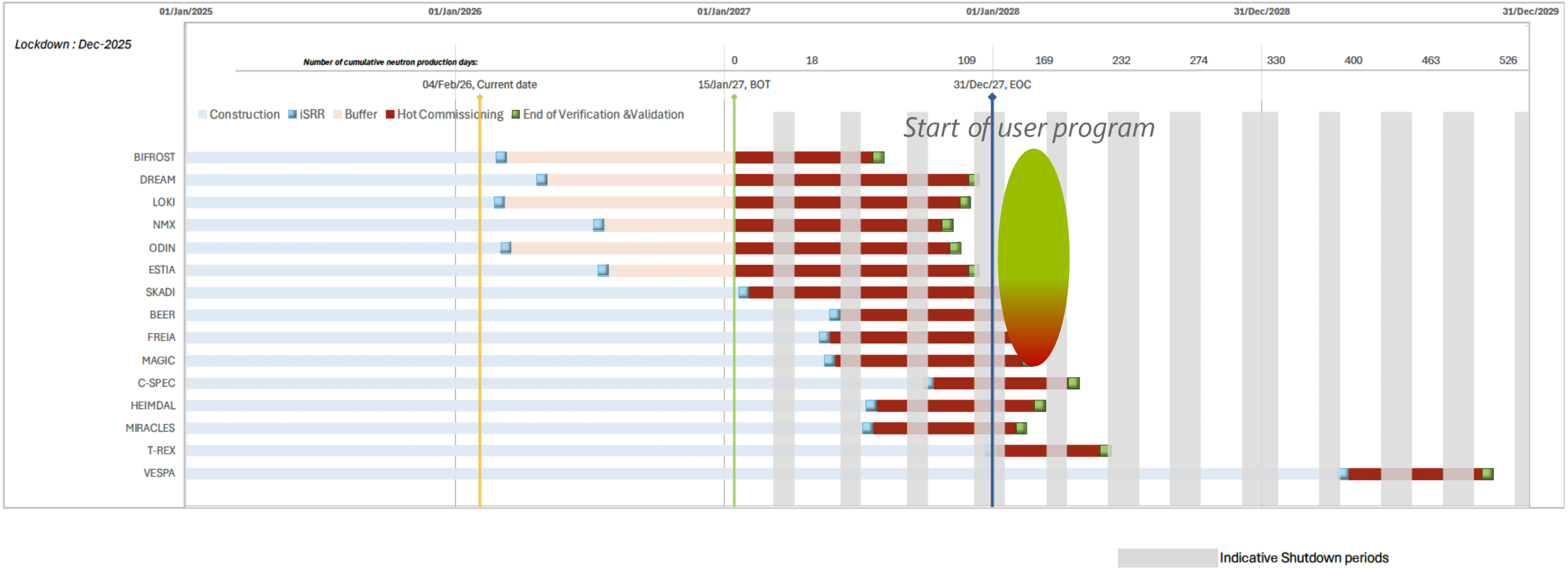
Agenda



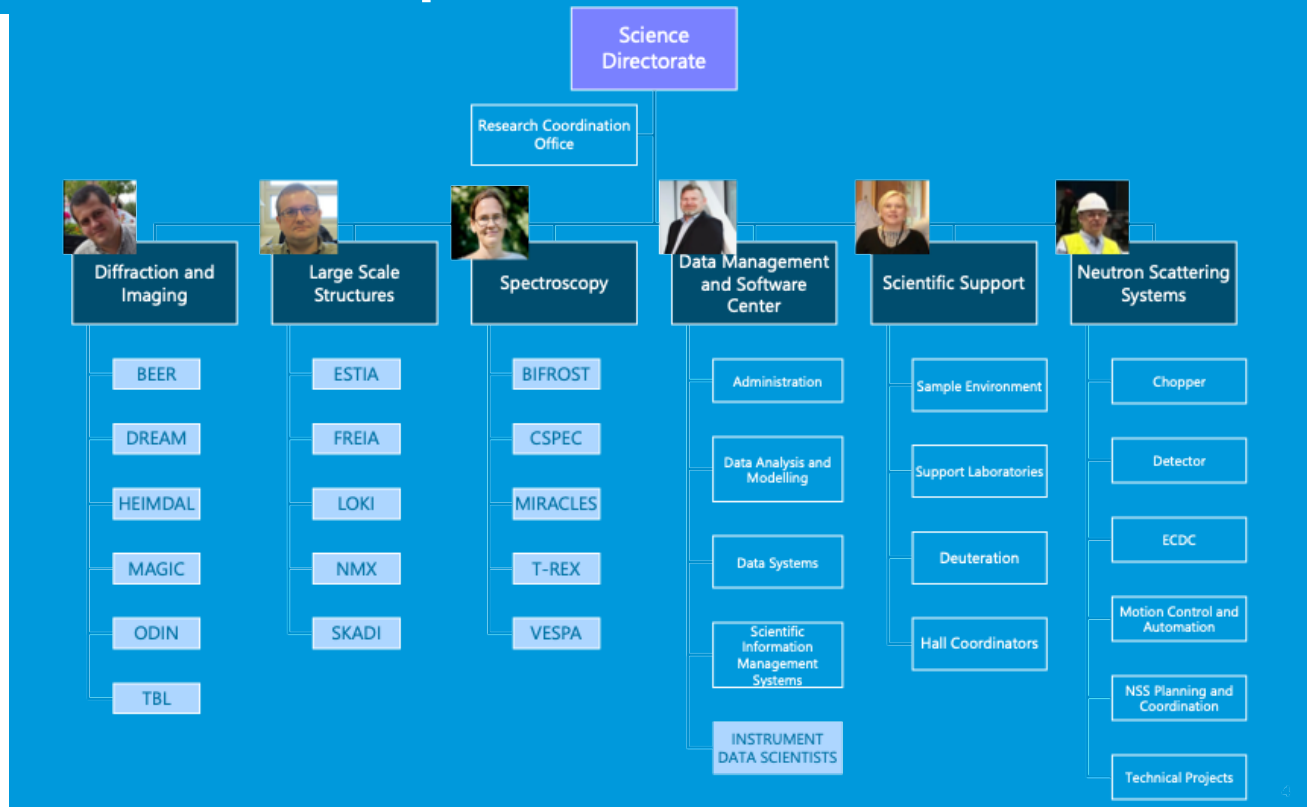


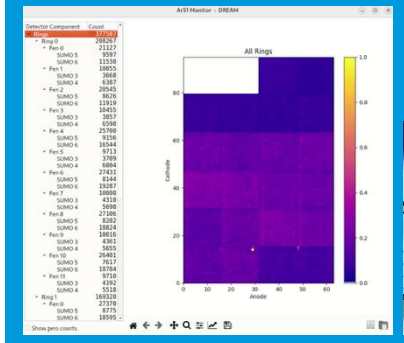
Current ambition: "launching a credible user programme"

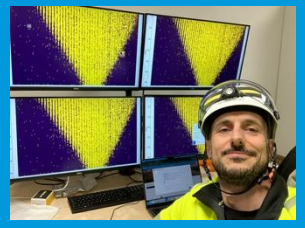
Start of user operation beginning of 2028 with 7 to 10 instruments
Very large number of activities going on in the science directorate!



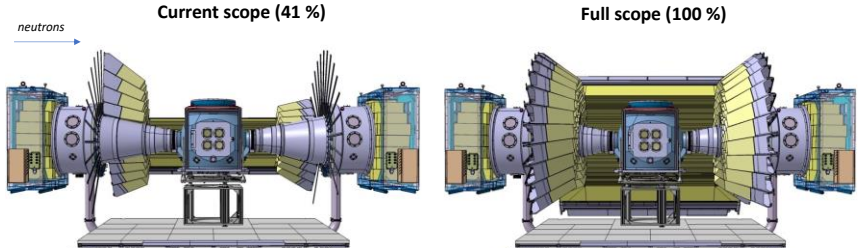
Activities in progress to prepare for scientific output with ESS instruments

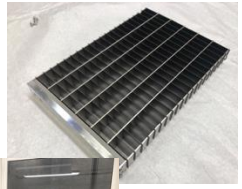


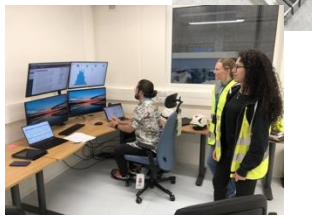




- Hiring scientific and support staff and reorganising towards a scientific user service facility – library facilities fully fledged
- Completion of first instruments, progress on software and sample environments
- Hot commissioning team set-up
- DMSC change of name and server location defined (DTU)
- Rescoping instruments continuing
  (DREAM/CSPEC/Vespa – next Heimdal)

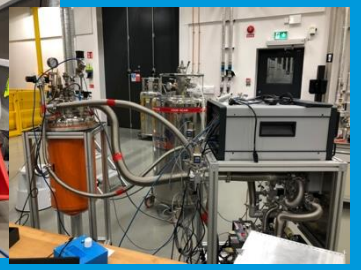




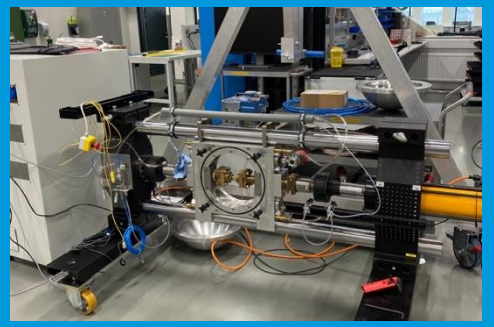






Sample environment & support laboratories

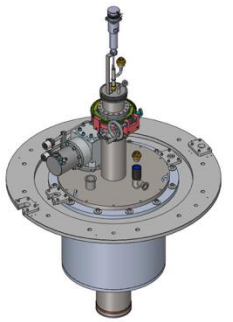


- Optimisation process in progress to develop and implement vision for support during commissioning and in steady state operation.
- Hiring of support labs, sample environment and hall coordinators group leaders in progress/done
- Internal call for deuteration for first science closed (19 proposals received)
- NSS SAR held on 11-12 February









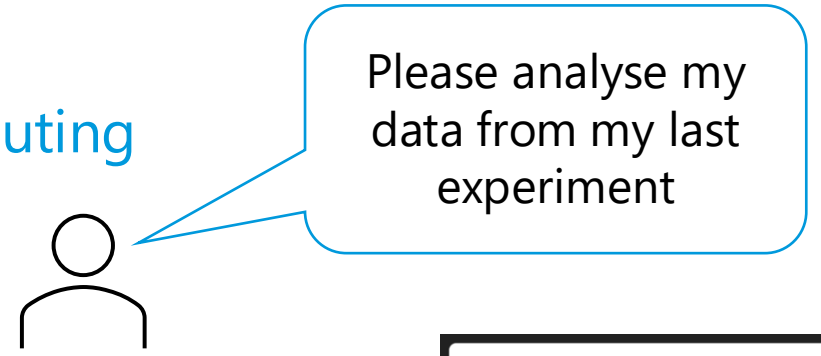
DMSC Updates

Now is Data Management and Scientific Computing Started to look ahead for operation

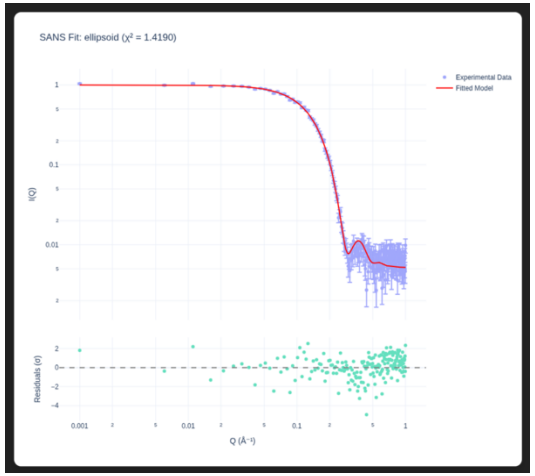
- Ramping up staff, incl. for **advanced modelling**
- Continues to prepare for **commissioning** of instruments.
- Continues to develop **UOS**, **SciCat**, **scipp** and **EasyScience**

  Expanding collaborations
- Active in **PaNOSC** & **EOSC**, particularly for **pan-finder**
- Pilotproject on AI assisted user service (**ESSAI**) starting with **Natural Language interface** for SANS analysis

Open for collaborations!



Output (although data file was attached – for now)



Model	Free parameters (k)	Key fitted parameters	Reduced χ^2	ΔAIC	ΔBIC	Interpretation
Sphere (monodisperse)	3	R ≈ 15.4 Å	~1.66	+23	+21	Acceptable first approximation, but statistically disfavoured
Sphere (polydisperse)	4	R ≈ 15.0 Å, PD ≈ 8–10%	~1.42	0	0	Statistically justified; polydispersity likely mimics anisotropy
Ellipsoid (monodisperse)	4	Rp ≈ 12.9 Å, Req ≈ 16.8 Å (AR ≈ 1.3)	~1.42	0	0	Best physical model; mild anisotropy, not overfitted

Preparing for user operation

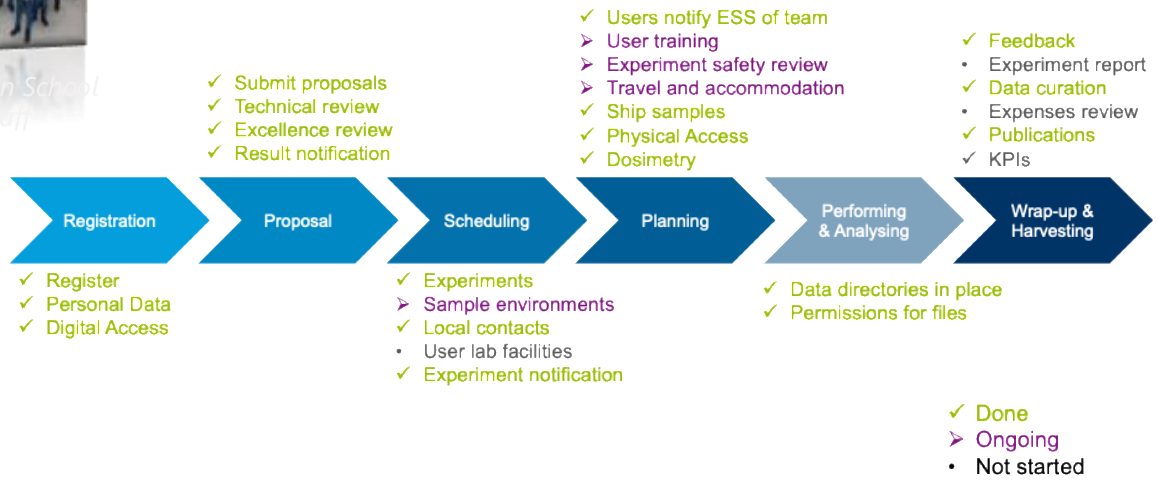
- User access preparation (policies, physical access, training, …)
- Preparing web interface for users
- Brainstorming with user communities
- Organisation of training schools
- Participation to large number of grants' applications for first science and sample environment/sotware developments
- Internal and external post-doc positions
- Policies and rules for supervising students
- Hiring of research coordination group leader in progress

HERCULES European School
Students and ESS staff

International Conference on Neutron Scattering (ICNS2025)
800 delegates
500+ participants visited ESS with a focus on instruments
80% rated the visit 5 out of 5
73 ESS staff contributed through talks, posters, and informal sessions
5 mini-symposia - 3 satellite workshops

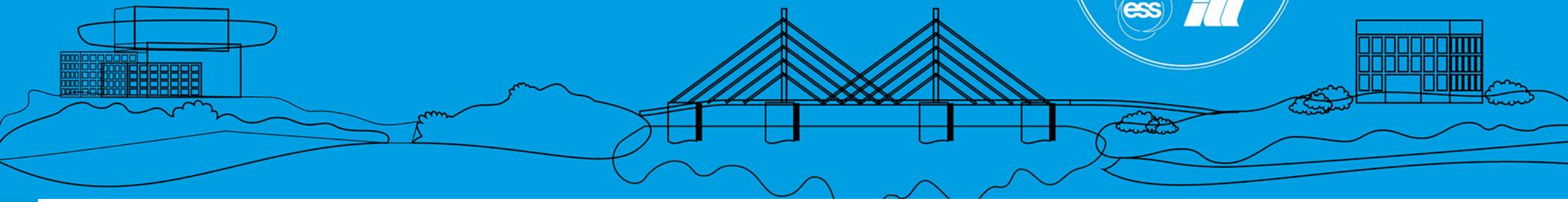
To come: ESS/ILL User Meeting/October 18-20 2025
+ Satellites on First science

The User Journey



ESS ILL USER MEETING 2026

18-20 NOVEMBER
LUND, SWEDEN



https://indico.ess.eu/event/3945/

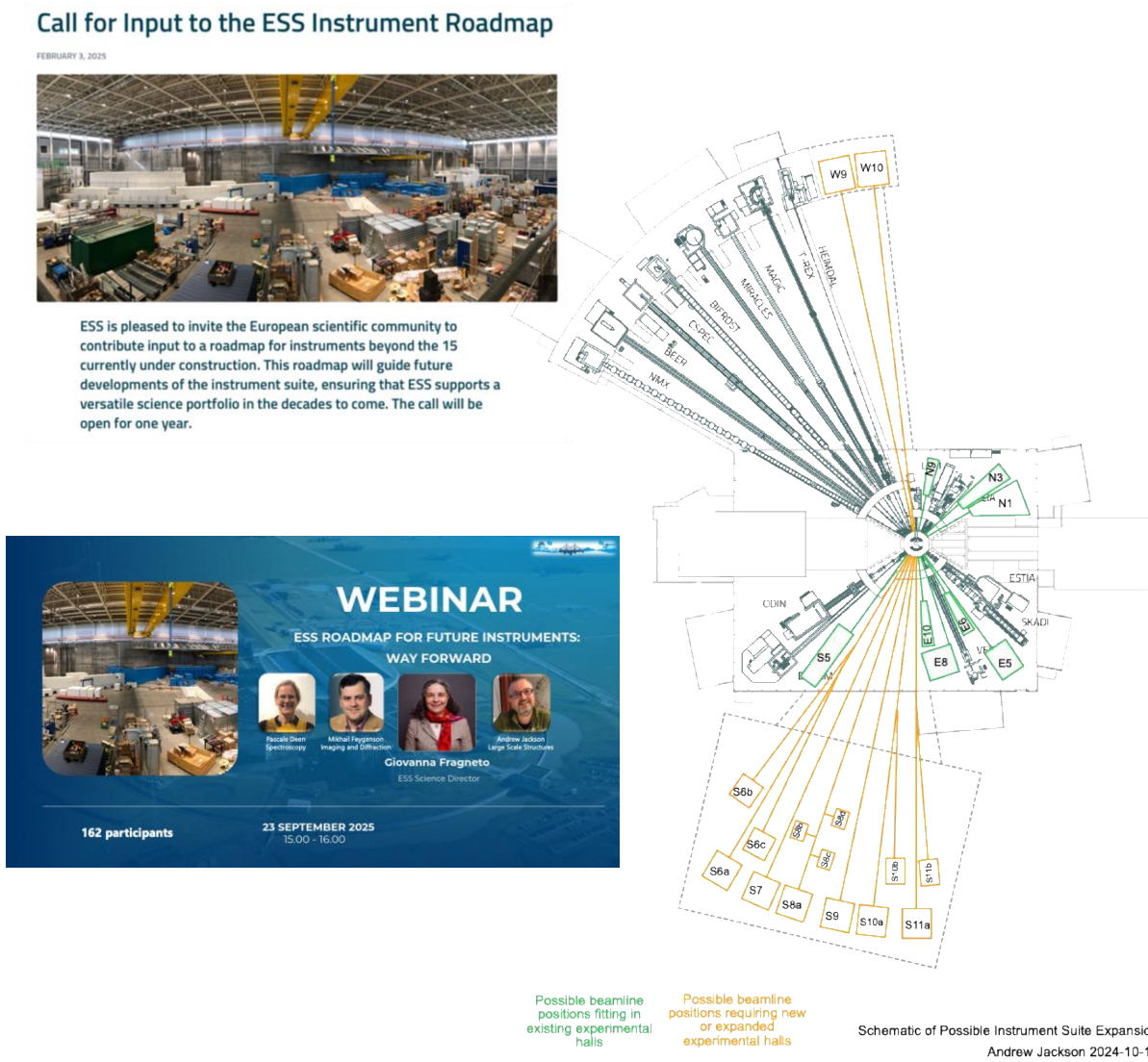
Scientific Programme
The event spans three days, from noon to noon. The first day will include a self-guided tour of the ESS instrument halls and instruments, facility updates and a moderated panel discussion.
The following days will feature sessions on the scientific themes:

- **Quantum Materials**
- **Liquid-Liquid Phase Separation**
- **Additive Manufacturing**
- **Batteries and Energy Materials**
- **Nuclear and Particle Physics**

Organisation of satellite meetings on first science is strongly encouraged, please contact Raquel Costa (raquel.costa@ess.eu) if you are willing to organise one

ESS Instrument Roadmap

- ✓ Call closed on March 27
- ✓ 23 proposals received including fundamental physics



We strive to profit from the expertise of our European partners and we have been looking at possible collaboration models within a new FRAMEWORK for PARTNERSHIPS *(C43)*

Process selection validated by SAC

Step 1: STAP Reviews (April 2026)

• STAPs review proposals based on four criteria (Impact, Feasibility, Capacity and Capability, Uniqueness).

Step 2a: Neutron Instrument Review (July 2026)

• An Instrument Review Committee is established to review neutron scattering and transmission proposals only (fundamental and particle physics proposal are reviewed through a separate parallel process).

•The committee applies four equally weighted criteria to assess the proposals:

1. Impact (scientific/industrial/societal)
2. Technical feasibility
3. Capacity and capability
4. Uniqueness and alignment with ESS source characteristics

Committee membership *(tbc☺)*:

- 4 SAC representatives
- 4 experts from the community
- Chairperson

Process selection validated by SAC

Step 2b: Fundamental *Nuclear* and Particle Physics Review (July 2026)

•A review process has already started by the STAP which SAC considers appropriate.

Step 3: ESS Management Assessment (Sep 2026)

•Combines prioritised lists from Instrument Review Committee and fundamental and particle physics reviews.
•Adds factors such as readiness and maturity, timeliness, risks, human resource needs, financial implications, implementation schedule, and strategic alignment.
•Produces revised priority list (with 1st and 2nd positions clearly defined).

Step 4: SAC and STAP Ratification (Oct 2026)

•ESS shares final list with SAC (and STAPs) for ratification.

Step 5: ESS Council Submission (Dec 2026)

•ESS management submits ratified proposal to Council.

Initial STAPs' evaluations (April meetings)

Specific feedback on each proposal in the following areas:

- Impact – *Potential for scientific, industrial, and societal impact*
- Feasibility – *Is the instrument feasible in technological terms? How much new*

technology needs to be developed?

- Capacity and Capability – *Does the instrument provide new capabilities and/or additional capacity to the ESS suite? How does it fit in the European instrumentation*

landscape? What is the potential user base?

- Uniqueness – *will the instrument provide new or unique capabilities that are needed by the European science community? Does the instrument make good use of the long-pulse?*

And..

Relative importance of new instruments against completion of scope of the existing instruments based on the list of completion scope in the table overleaf.

Advice on whether any of the new proposals could be combined or whether they could be executed as upgrades to existing instruments