

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

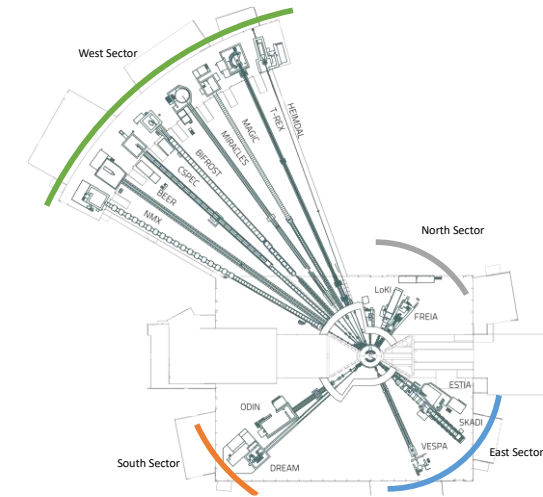
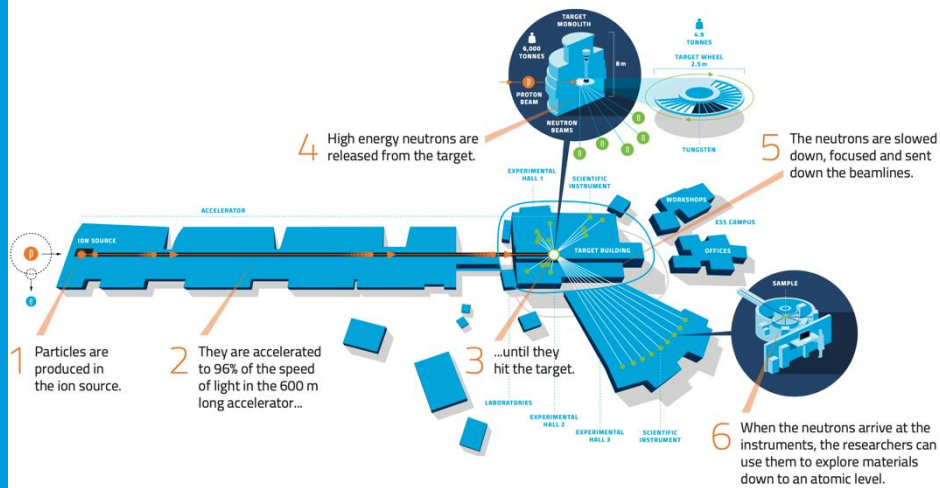
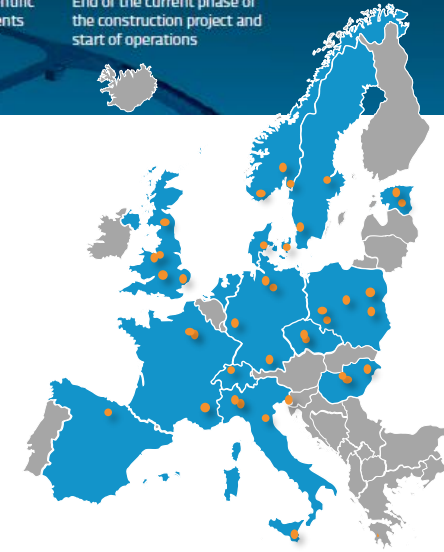
First neutrons – the first proton beam strikes the target

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

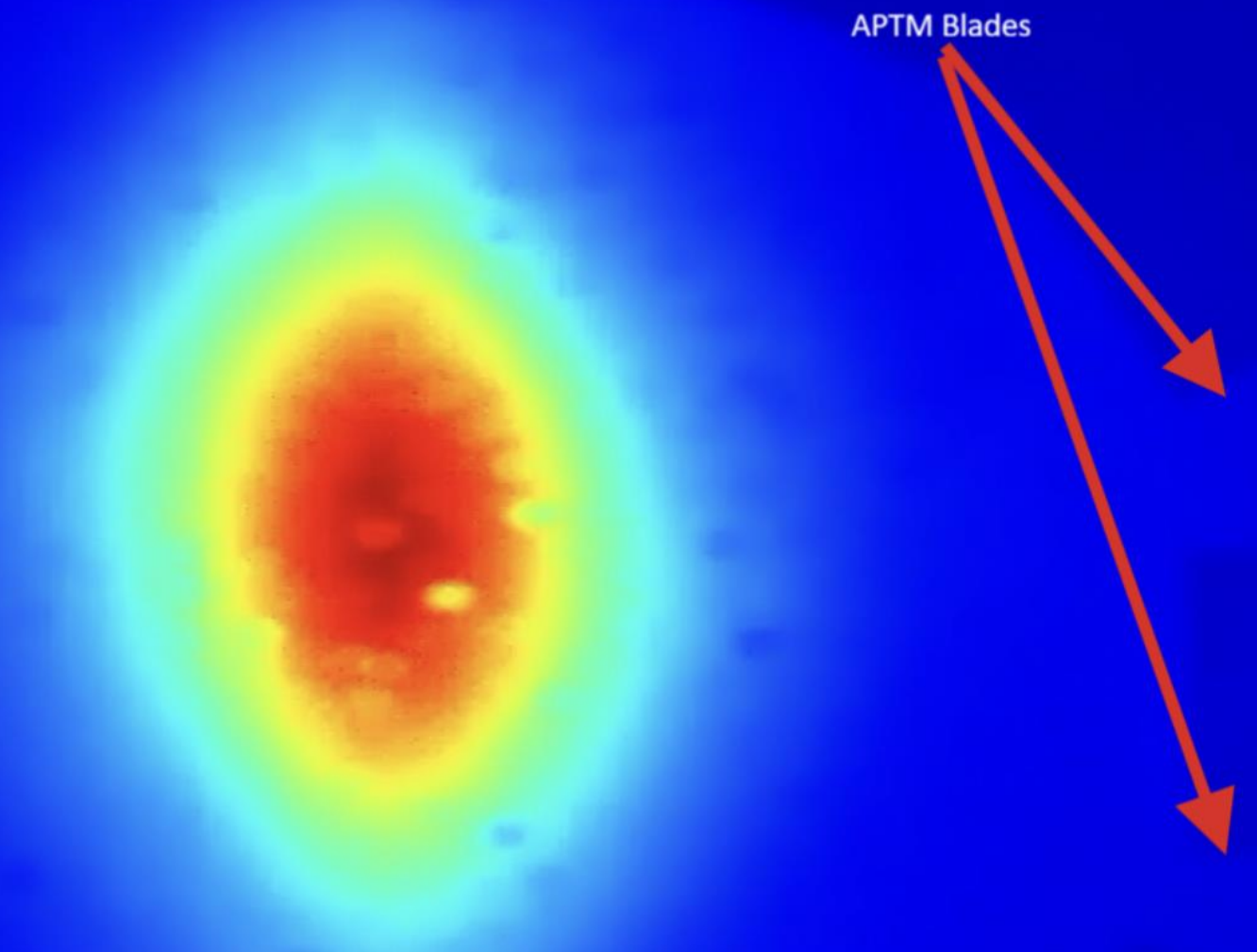


2025 Week 35: 27+6 CMs in place extending the accelerator capability. Preparations underway to complete connections, cooldown and resume commissioning to dump, then to target.

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

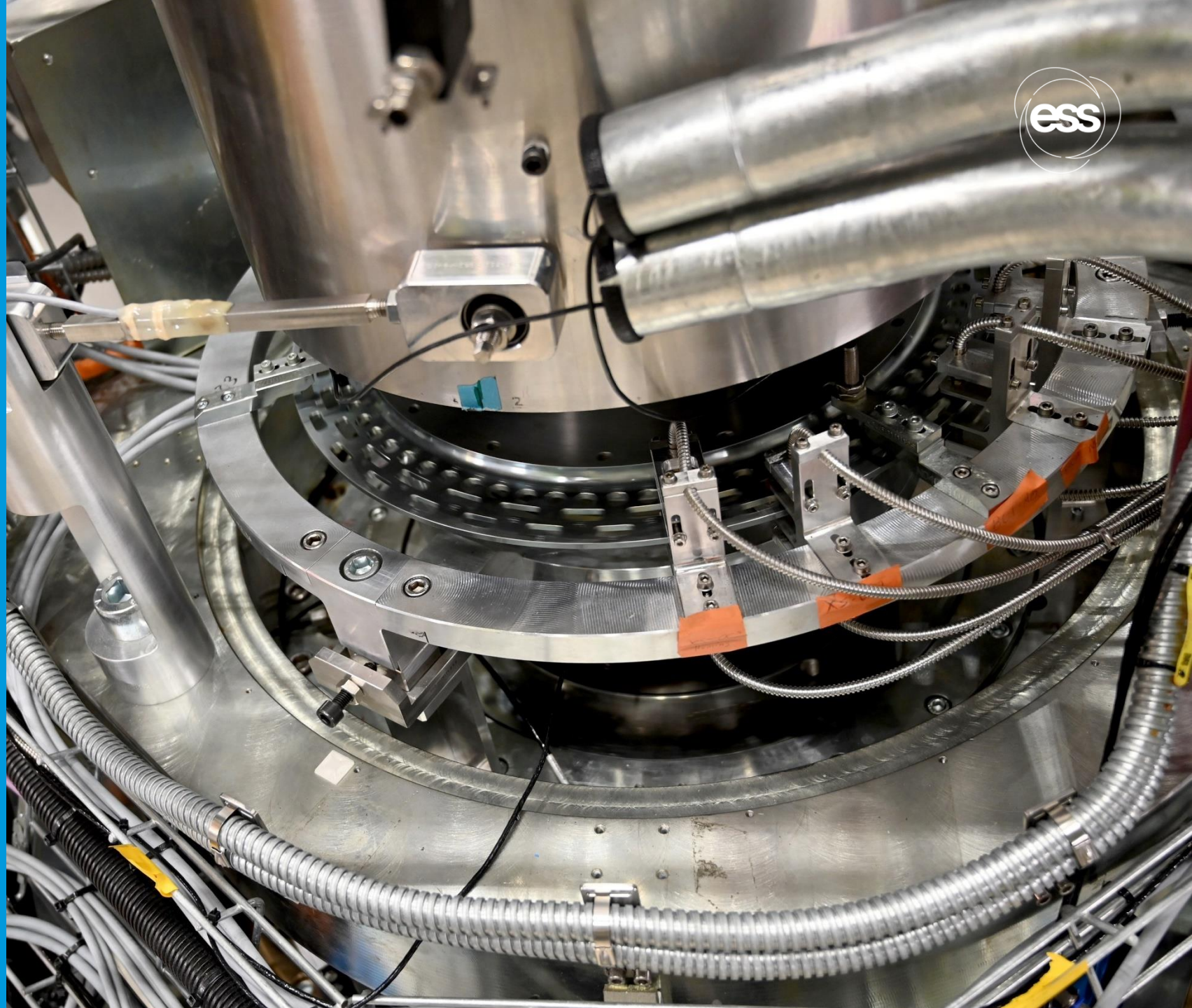
Target system controls in integrated testing

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

FREIA CAVE



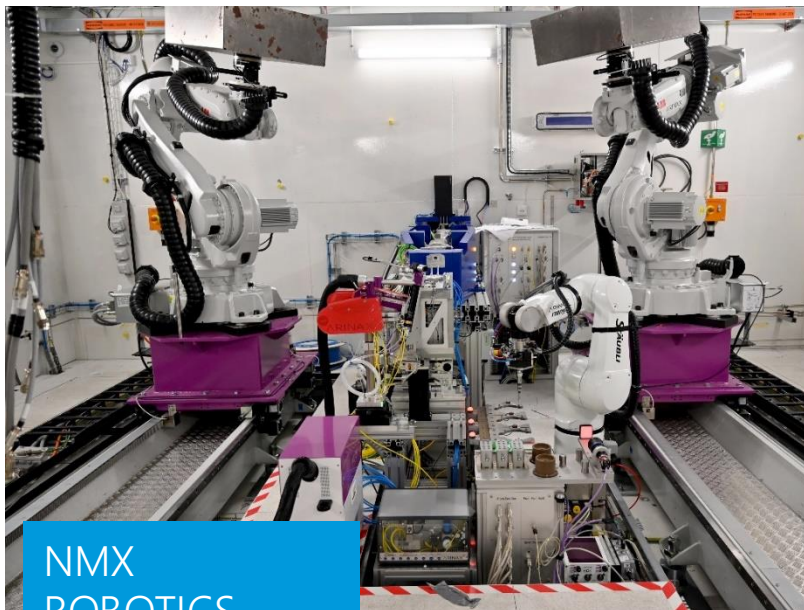
T-REX CAVE



E02 BEAMLINER GALLERY



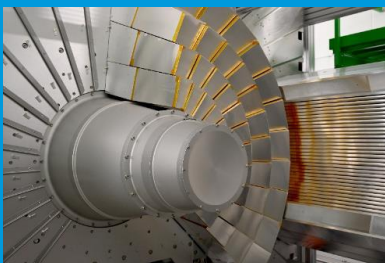
NMX ROBOTICS



Detector



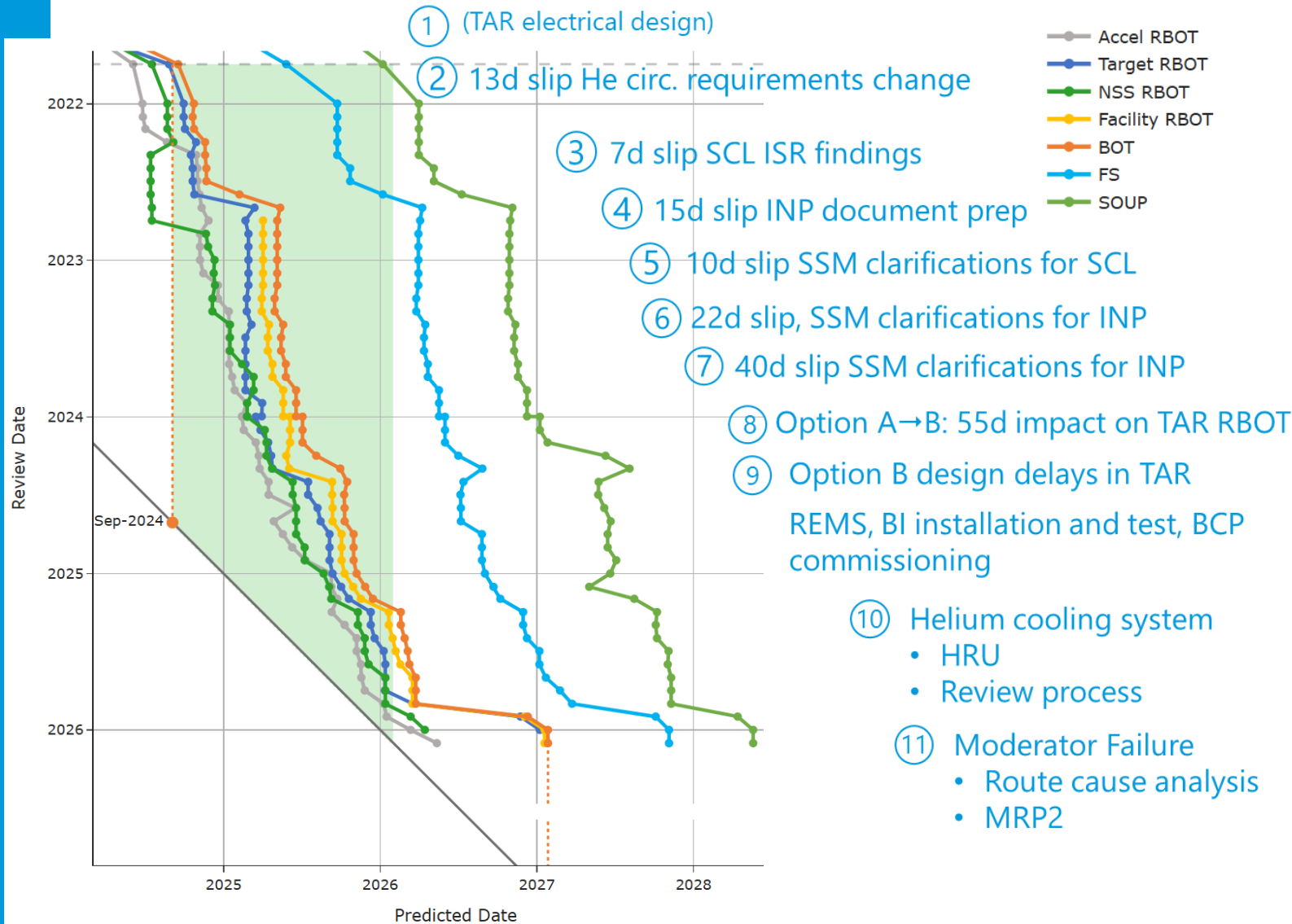
ESTIA & DREAM DETECTORS



Schedule and current status



Project Update (February data)



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

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





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	
Date: 25 March 2026	Location: STS Level, Neutron Building, Neutron Avenue
Time: 09:00 - 18:00	
ASCEND	
Participants:	
DREAM Team:	
Reserve Project Lead/Instrument Scientist	Peter Hackett (Lead Engineer) EIC
System Owner/Lead Engineer/LSB	Neil Fennell (Systems/Operative Engineer)
Public Board Conduit/Commissioning Scientist	Neilson Hooper (Instrument Engineer) LSB
Witness/Technical/Instrument Scientist	Wesley Tuckwell (Commissioning Scientist)
Neutron Committee:	
Michael Ferguson (Chair/Head of Infrastructure & Project Delivery)	Gregory Appleby (MSc Engineering Representative)
Robert Lumsden (Head of NCS Division)	Paul Ross (IP Representative)
Kevin Baker (CNS Representative)	Tolly Fyfe (MSc Instrument Representative)
Marion Taylor (Quality Representative)	Kevin Ross (IP Instrument Safety Representative)
Leslie Milnes (Standing Committee)	
Instrument Parties:	
Andrew Whitworth, Tania Calver, Andrew D'Elia, Christopher Northcote (STS)	Andrew Stewart (IP)
Observers:	
Lee Liddell (Head of Operations Division)	
Neil Reddy (Chief Engineer/Technical Officer Manager)	
Andrew Searns (Quality Commissioning Lead/LSB)	
Andrew Neill (Production Systems Team Lead, KCS)	
Thomas Pearson (Radiation Safety Representative)	
Other Interested Parties:	
Georgina Ferguson (Science Division)	Oliver Evans (Technical Instrument Control Scientist)
Andrew Jackson (Head of Large Scale Structures Division)	Neil Taylor (MSc Technical Lead/LSB)
Pauline Owen (Head of Instrumentation Division)	Kevin Hooper (Instrument Safety Lead)
James Walker-Brown (Principal Scientist)	Adrian Taylor (IP Systems Engineer)
Robert Hodge (Head of Instrumentation Division)	Thomas Sully (MSc Control Lead)
Michael Jamieson (IC)	Wesley Hooper (MSc Group Leader)
Michael Ross (MSc Technical Lead/LSB)	Neilson Hooper (MSc Instrument Safety Representative)

System Acceptance Review	
09:00 - 09:15	Welcome / Meeting Role, Initial Programme
09:15 - 09:20	Schedule Overview of Instrument (Plasma/Rocks)
09:20 - 10:00	Instrument Components Overview (Area Induct)
10:00 - 10:15	CRS and ORFans (Status Review)
10:15 - 10:30	Overview of NCR/MSI Software Design
10:30 - 10:35	Coffee break
10:35 - 11:05	Choppers (EIK Nelson)
11:05 - 11:15	Motion Control and Automation (Thomas Al/Sebans)
11:15 - 11:30	Daniel Ben A. Beam, Neutrons Area (Sebans & James Substant)
11:30 - 11:40	K3 (Orfan) (Sebans)
11:40 - 11:50	ELC (George Kierkegaard)
11:50 - 12:00	EMSC: Data Installation / Backup software (Chris Durbak)
12:00 - 12:05	Lunch break
12:05 - 12:10	Integrated Test Results (Eleanor Purdie)
12:20 - 12:35	Scientific Instrument Commissioning Plan (Kerwin Packer)
Instrument Safety Readiness Review	
13:00 - 13:15	Welcome / Meeting Role, Initial Programme
13:15 - 13:30	Summary of DREAM and General Safety (Area Induct)
13:30 - 14:20	Operations and Maintenance documents status (Oliver Barrett)
14:20 - 14:35	Shielding Calculations (Yusuf Akmal Karimzadeh)
14:35 - 15:00	Coffee break
15:00 - 15:15	Overview of Radiation Safety (Eleanor Purdie)
15:15 - 15:30	Complete of Instrument Haswell Analysis (Oliver Barrett)
15:30 - 15:40	Personnel Safety Systems (Oliver Barrett)
15:40 - 15:50	Motion Safety System (Jacob O'Hara)
15:50 - 16:00	IBMS presentation (Area Induct)
16:00 - 17:30	CLOSING/STANDING: Available for Q&A/MSI support

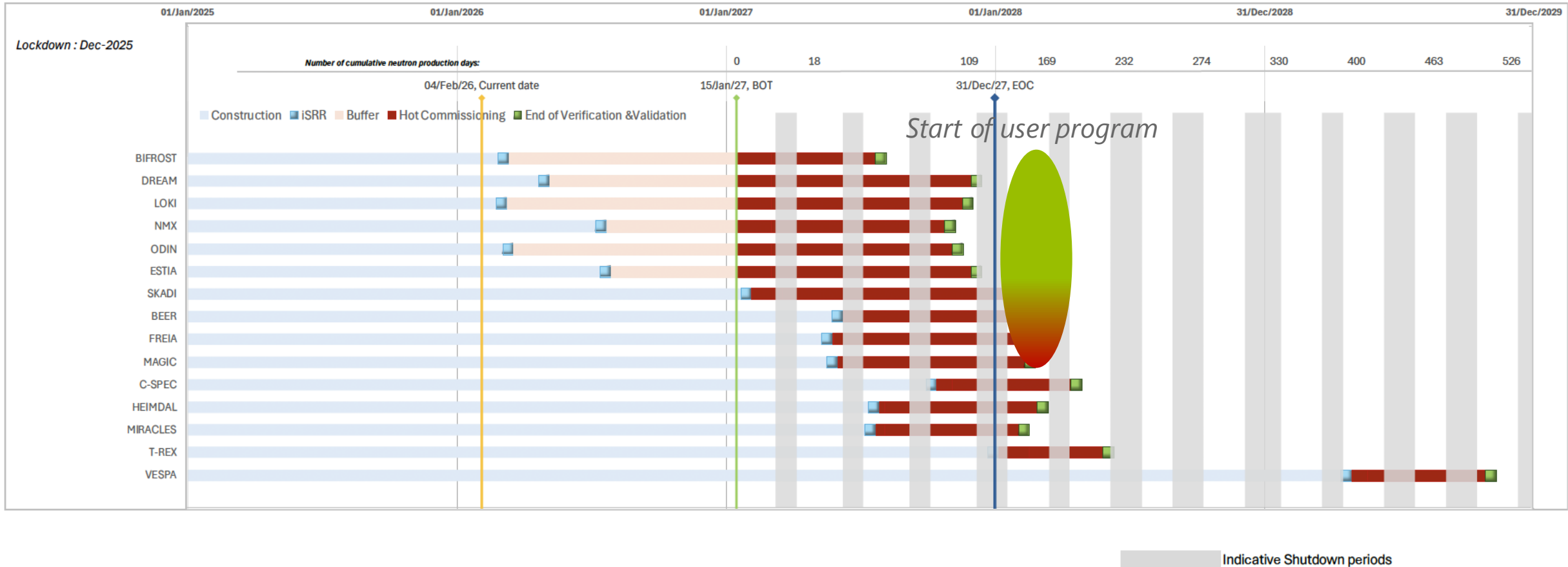
Site Visit & Instrument Safety Systems Demonstration for DREAM	
Date: 21 March 2026	Location: STS Level, Neutron Building, Neutron Avenue
Time: 13:15 - 16:45	
ASCEND	
DREAM Site Visit and Safety Systems Demonstration by the Neutron Committee (M)	
13:15 - 13:30	Event at STS and STS 15 location to STS-HS Review (Lumsden)
13:30 - 13:45	Presentation of instrument components, including safety systems (Eleanor Purdie)
13:45 - 14:00	Operational procedures: PSD and Motion Safety (Eleanor Purdie)
14:00 - 14:15	Operational procedures: Team-in-charge transfer to sample area, status and motion at STS and STS 15 location (Eleanor Purdie)
Participants:	
DREAM Team:	
Reserve Project Lead/Instrument Scientist	Neilson Hooper (Lead Engineer) EIC
System Owner/Lead Engineer/LSB	Neil Fennell (Systems/Operative Engineer)
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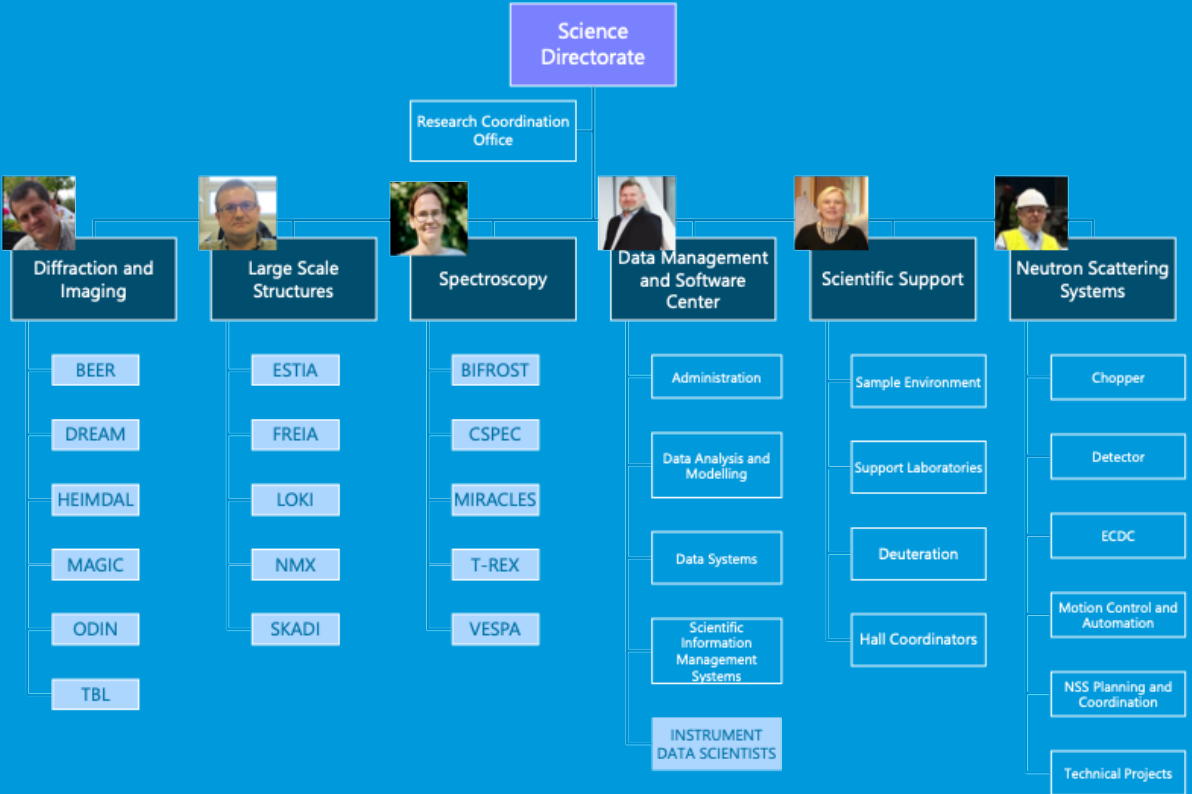
Current ambition: "launching a credible user programme"



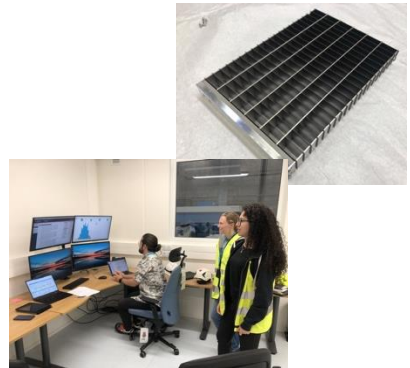
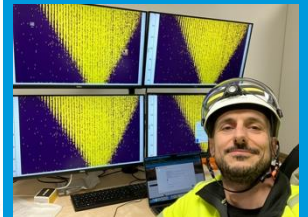
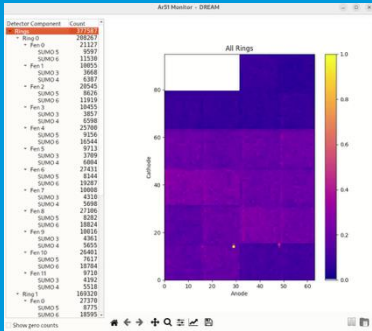
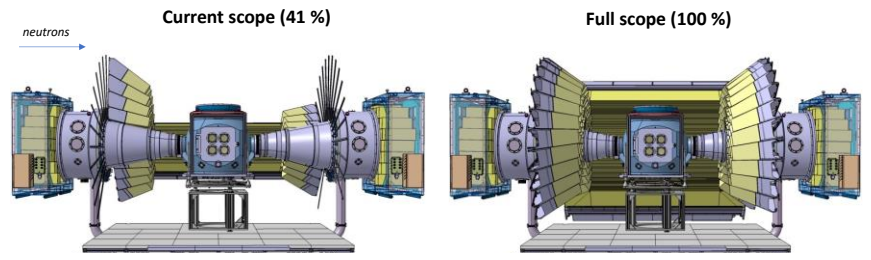
Start of user operation beginning of 2028 with 7 to 10 instruments
Very large number of activities going on in the science directorate!



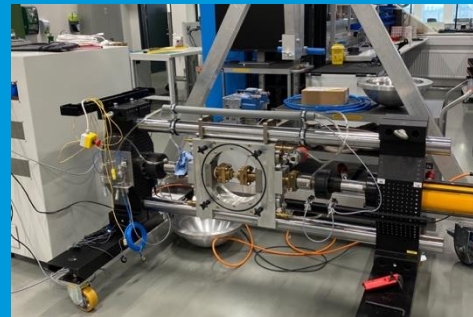
Activities in progress to prepare for scientific output with ESS instruments



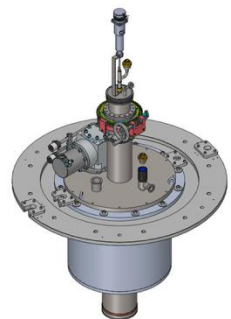
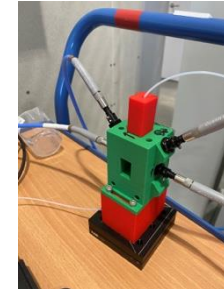
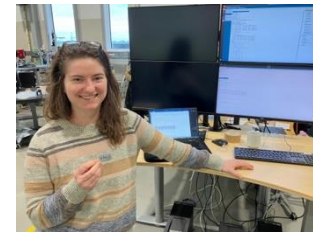
- Hiring scientific and support staff and reorganising towards a scientific user service facility – library facilities fully fledged
- Completion of first instruments, progress on software and sample environments
- Hot commissioning team set-up
- DMSC change of name and server location defined (DTU)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



Sample environment & support laboratories

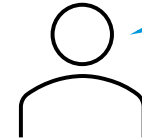


- Optimisation process in progress to develop and implement vision for support during commissioning and in steady state operation.
- Hiring of **support labs**, **sample environment** and **hall coordinators** group leaders **in progress/done**
- Internal call for deuteration for first science closed (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

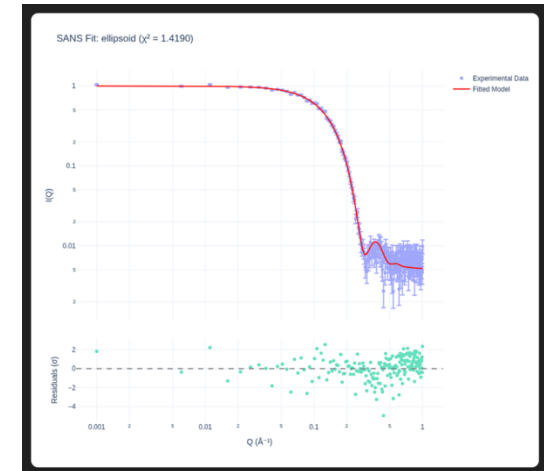


Please analyse my data from my last experiment

- 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	$R \approx 15.4 \text{ \AA}$	~ 1.66	+23	+21	Acceptable first approximation, but statistically disfavoured
Sphere (polydisperse)	4	$R \approx 15.0 \text{ \AA}$, PD $\approx 8\text{--}10\%$	~ 1.42	0	0	Statistically justified; polydispersity likely mimics anisotropy
Ellipsoid (monodisperse)	4	$R_p \approx 12.9 \text{ \AA}$, $R_{eq} \approx 16.8 \text{ \AA}$ (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/software developments
- Internal and external post-doc positions
- Policies and rules for supervising students
- Hiring of research coordination group leader in progress



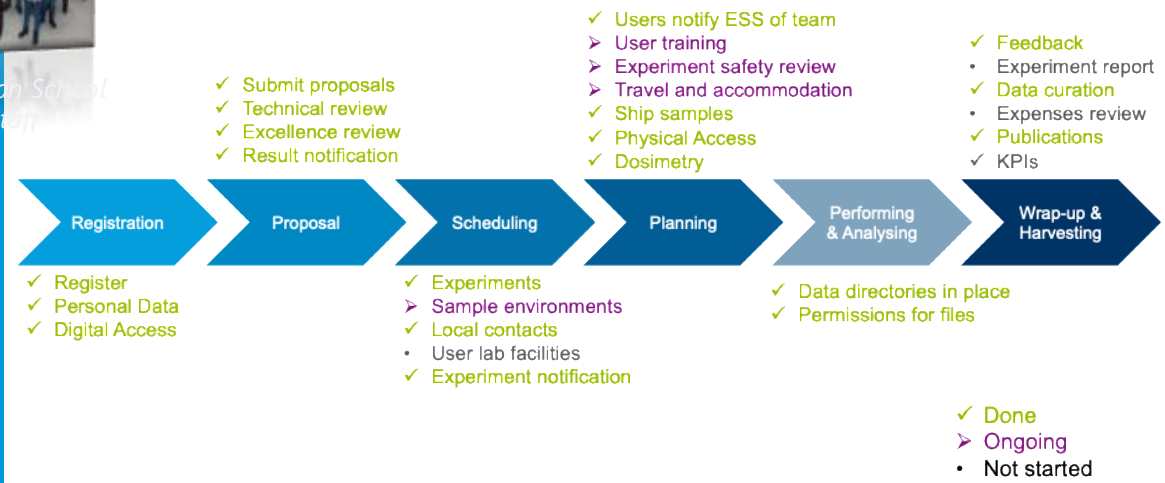
HERCULES European School
Students and ESS staff



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

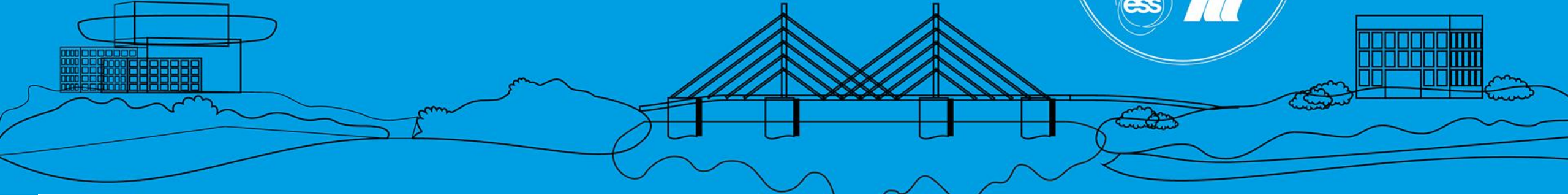
**To come: ESS/ILL User Meeting/October 18-20 2025
 + Satellites on First science**

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

Call for Input to the ESS Instrument Roadmap

FEBRUARY 3, 2025



ESS is pleased to invite the European scientific community to contribute input to a roadmap for instruments beyond the 15 currently under construction. This roadmap will guide future developments of the instrument suite, ensuring that ESS supports a versatile science portfolio in the decades to come. The call will be open for one year.

WEBINAR
ESS ROADMAP FOR FUTURE INSTRUMENTS:
WAY FORWARD

Pascale Dean
Spectroscopy

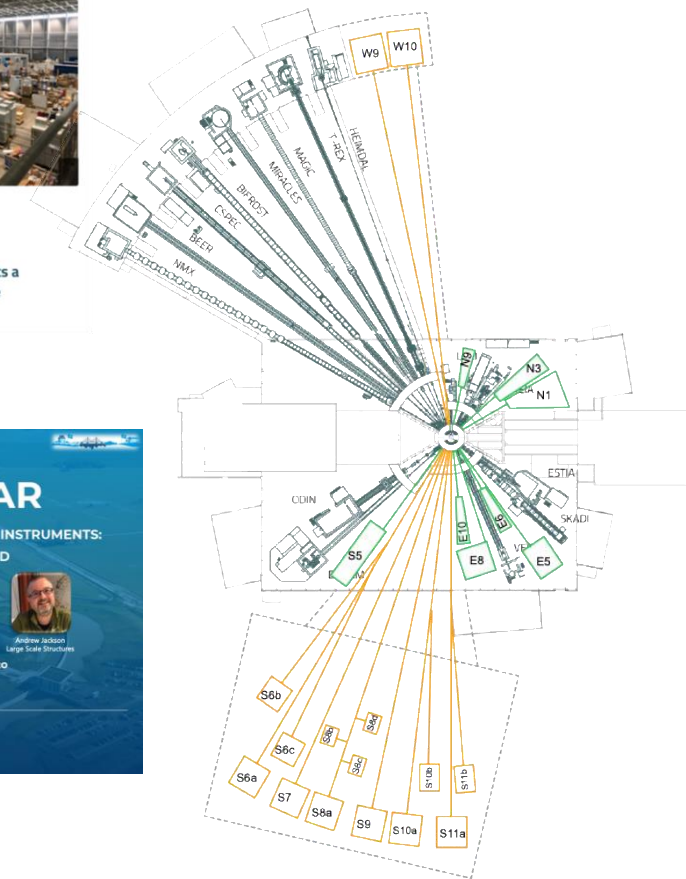
Mikhal Feygenzon
Imaging and Diffraction

Andrew Jackson
Large Scale Structures

Giovanna Fragneto
ESS Science Director

162 participants

23 SEPTEMBER 2025
15:00 - 16:00



Possible beamline positions fitting in existing experimental halls

Possible beamline positions requiring new or expanded experimental halls

Schematic of Possible Instrument Suite Expansion
Andrew Jackson 2024-10-1

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