

A detailed wireframe architectural rendering of a large, circular structure, possibly a particle accelerator or a large-scale facility. The structure is composed of multiple concentric rings and radial supports, creating a complex, grid-like pattern. The rendering is shown from an elevated perspective, highlighting the circular symmetry and the intricate details of the design.

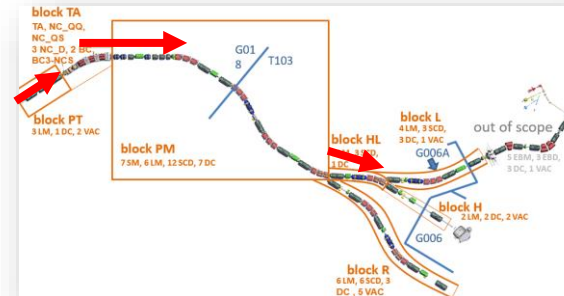
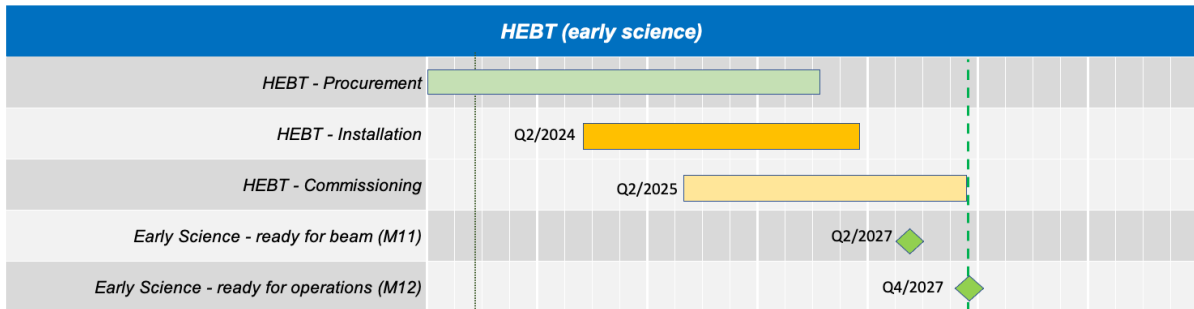
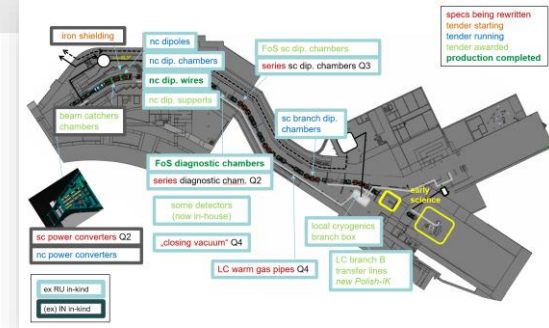
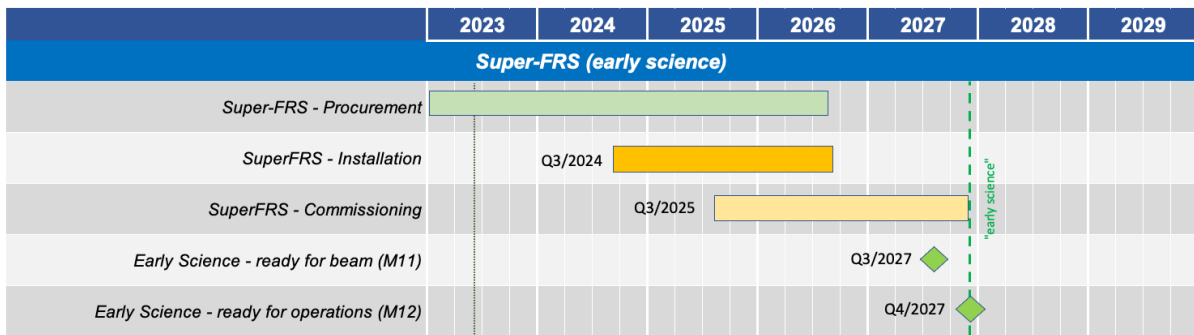
Status of FAIR Project

**FAIR/GSI Research Retreat
18th & 19th July 2023**

Jörg Blaurock
Technical Managing Director GSI GmbH & FAIR GmbH

- FAIR Re-baselining results
- FAIR ACC Highlights
- FAIR Project Progress – Civil Construction
- ACC Installation Preparation
- Summary

Early Science Accelerator – Super FRS

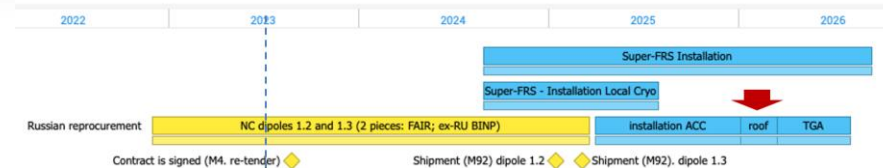


Installation direction, sequence

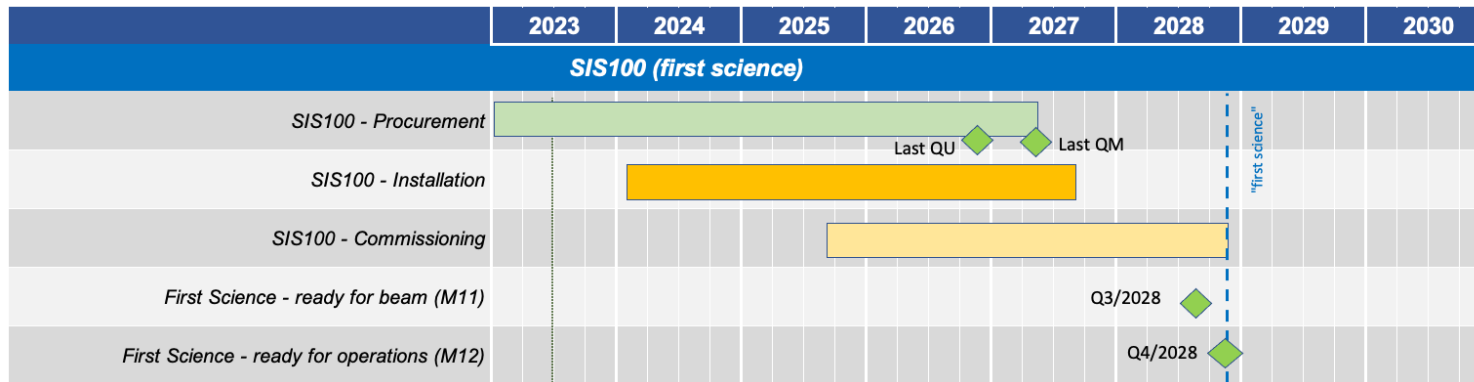
critical path

! ACC (In-Kind) providers need to stick to the committed or needed **delivery dates** of the components

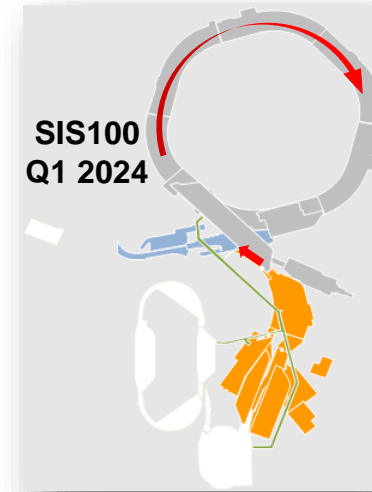
Critical path components: S-FRS: Local Cryo (Poland) - NC Magnets (Russ. re-procurement) - Iron Roof (India) - HEBT: Russ. re-procurements



First Science Accelerator – SIS100



data date: 28/06/2023

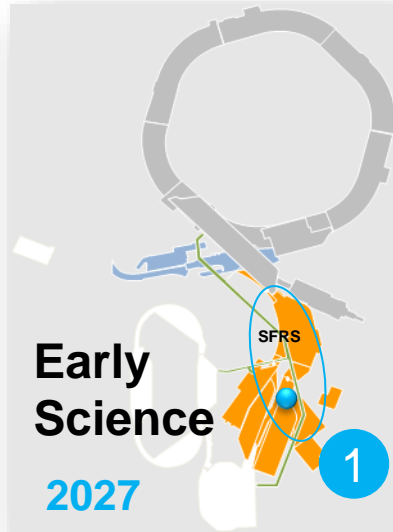


Assumption for FS:

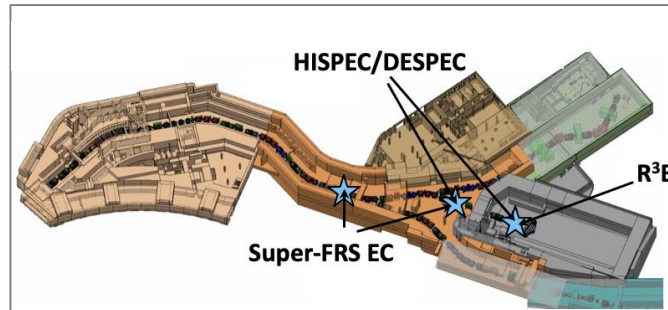
- SIS100 QDUs will be delivered by JINR until end of 2026 with a restart of shipment in December 2023.
- The time schedule corresponding to an alternative industrial manufacturing still needs to be worked out with industrial partners.

Rebaselining 2023 – Experiments

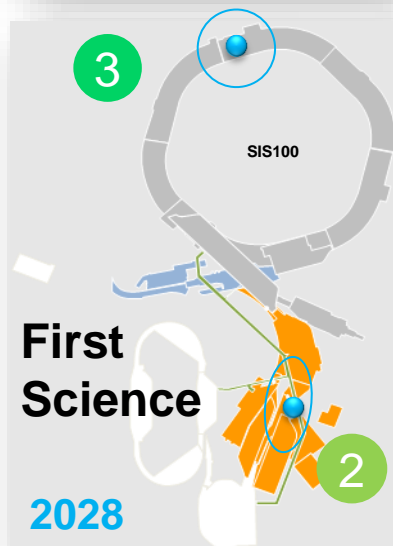
(minimal configuration, further implementation under discussion with the appropriate committees)



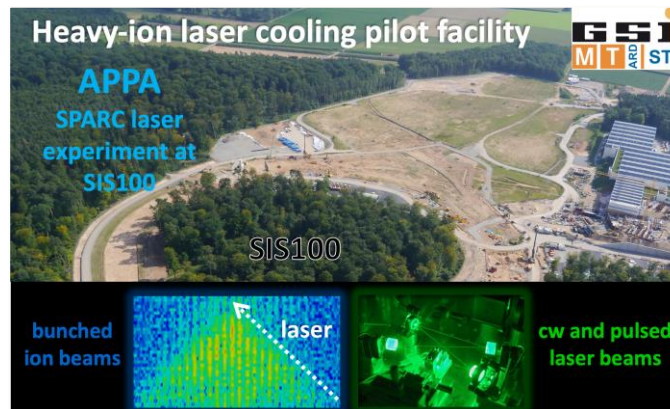
1 2 NUSTAR (ES & FS)



- Early science in 2027 is realistic for NUSTAR: R3B, Super-FRS EC and HISPEC/DESPEC (partially)
- Installation follows the **installation** of HEBT and **Super FRS (critical path)**
- Funding of some NUSTAR experiment infrastructure to be secured from common funds



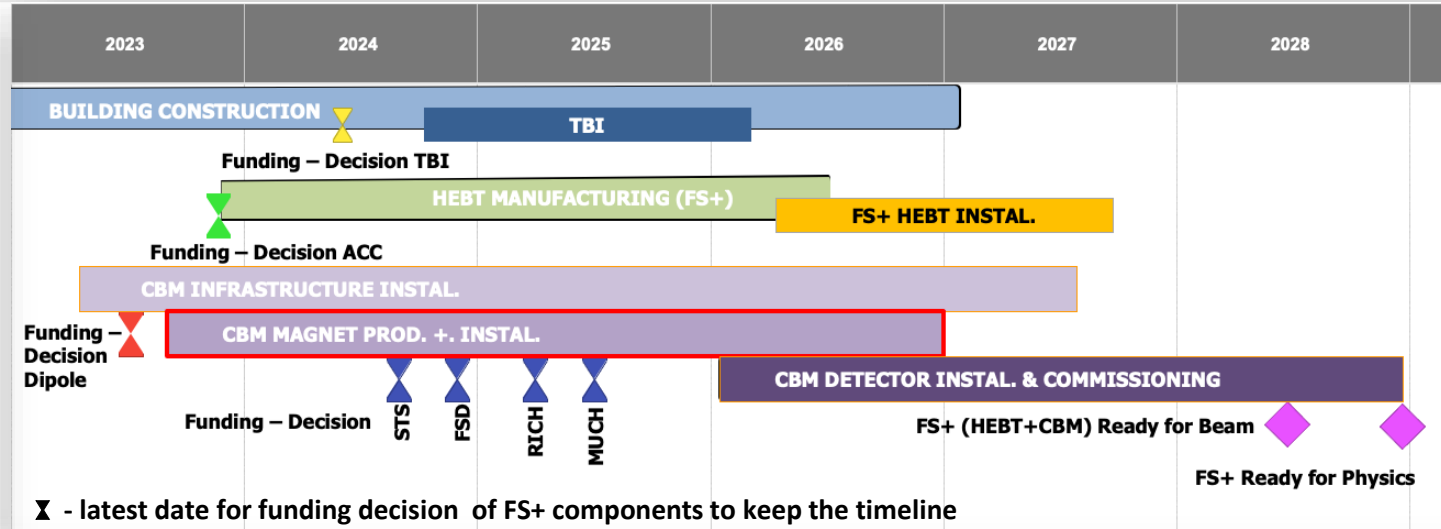
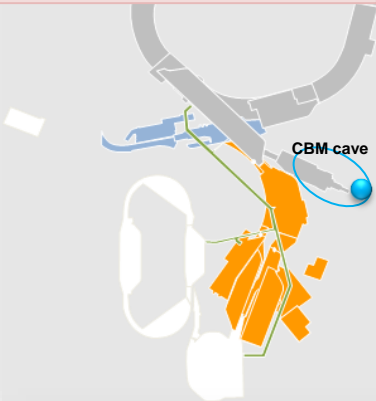
3 APPA (FS)



- First science in 2028 is realistic for APPA: SPARC laser experiments @SIS100 and NUSTAR: R3B, Super-FRS EC and HISPEC/DESPEC (partially)
- Installation follows the installation of **SIS100 (critical path)**
- Funding of APPA laser experiment to be secured through German university funding

First Science + in 2028, CBM

Action 2: Release for procurement CBM Magnets



- First science + in 2028 is realistic for CBM (◆)
- Commissioning of buildings and detector installation requires timely completion of **TBI (X)**
- Commissioning w/ beam follows the commissioning of SIS100 and **HEBT (X)**
- **critical path of the CBM: CBM dipole magnet (X) re-procurement (FAIR) and installation**
- Re-procurement (X) of Russian IKCs required for timely installation of CBM experiment
- **Support of national Funding Agencies is absolutely crucial for the magnetism of CBM!**

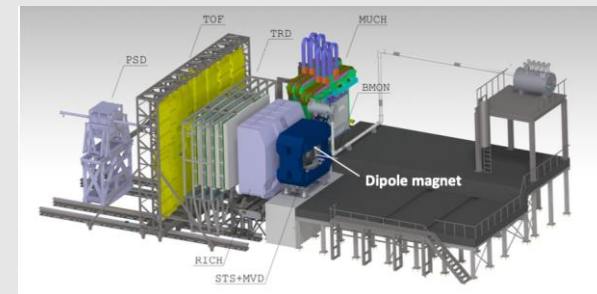


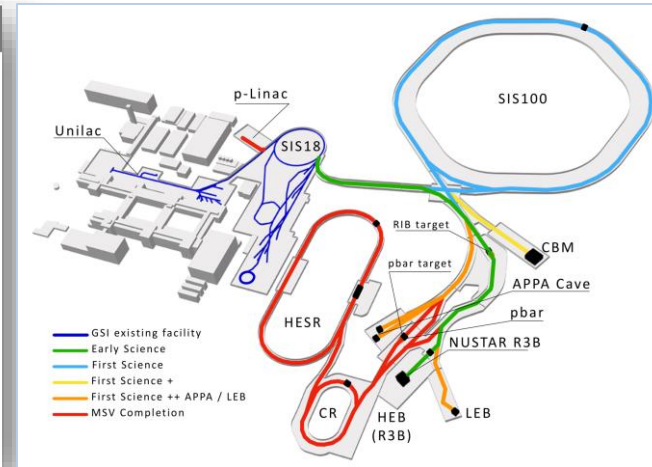
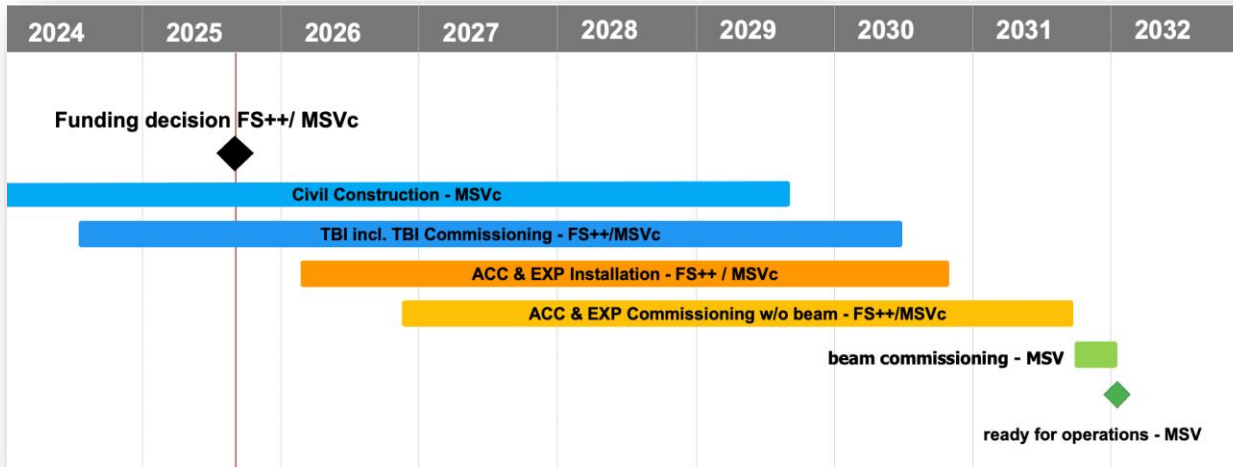
Table 1: Components/services to be procured for the completion of the CBM science programme, their estimated costs (current price level) and their latest date for procurement/expense to keep the timeline.

ID	Type	Component/Service	Estimated Cost (Mio. €)	Latest Date
1	EXP	CBM SC Dipole magnet	4-5	July 2023
2	EXP	CBM Silicon Tracker System	0,9	Q3 2024
3	EXP	CBM PSD	0,5	Q4 2024
4	EXP	CBM RICH	1,0	Q2 2025
5	EXP	CBM MUCH	2,0	Q3 2025
6	ACC	CBM beamline magnets	4,2	Q4 2024
7	ACC	CBM beamline vacuum comp.	2,3	Q4 2024
8	S&B	TGA CBM cave	14,3	Q2 2024
9	S&B	TGA CBM cave risks	7	2024/2025
		Sum	37,2	2024

See: 6d_CBM-Milestones-2023-11-16.pdf

Outlook: Steps beyond FS & FS+:

FS++ APPA/LEB & MSVc



- Working assumption pending on decisions by the shareholders of FAIR
- Steps beyond FS+ require additional funding, ideally to be in place by Q3 2025 so that the existing FSB Team and contractors are still in place
- CR layout modified according to MAC recommendation

- Decision 2025
- FS++ APPA/LEB ready for operation – 2030
- MSVc ready for operation – 2032

June 2023

Linde Cryo facility approaching the end of installation works on FAIR site.



May 2023

S-FRS series Multiplet pre-assembly works at GSI/FAIR campus are progressing well.



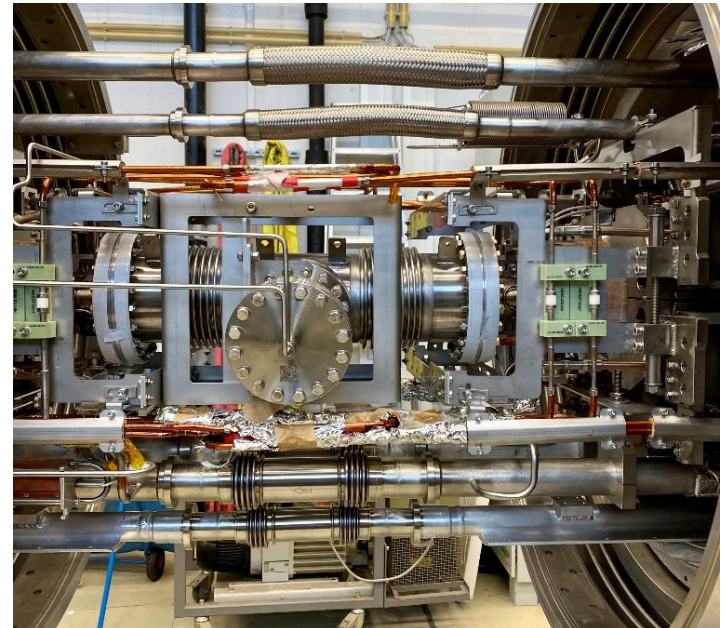
May 2023

Components of the Upstream Platform (Czech in-kind contribution to FAIR) have been delivered to FAIR. The installation of the platform in the CBM cave has been performed.



Q2-Q3-2023

String Test SIS100 - installation preparation
Successful completion of welding operations on interconnections.



FAIR Highlights – Storage and Logistics (Part 3)

Completed and delivered high-tech components for accelerator and experiments



SIS100 Dipoles complete



He-By-pass lines from Poland



Racks from India



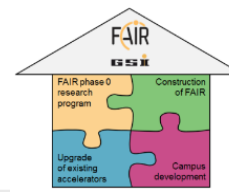
Storage area Weiterstadt: approx. 9.900 m²
4.195 objects (Components, assemblies, boxes)

50% of SIS100 components stored
90% of HESR components stored

Ultra-heavy deliveries to site (load and vehicle 120to-60m)

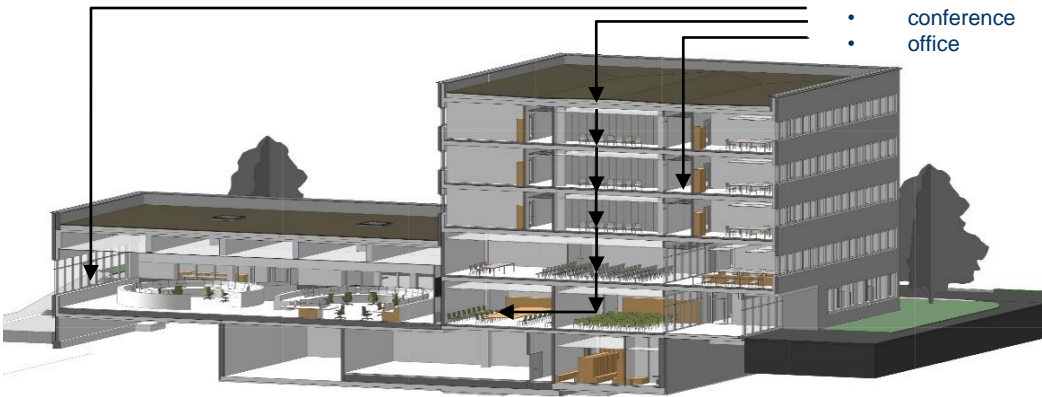


Development on Campus (Part 4)



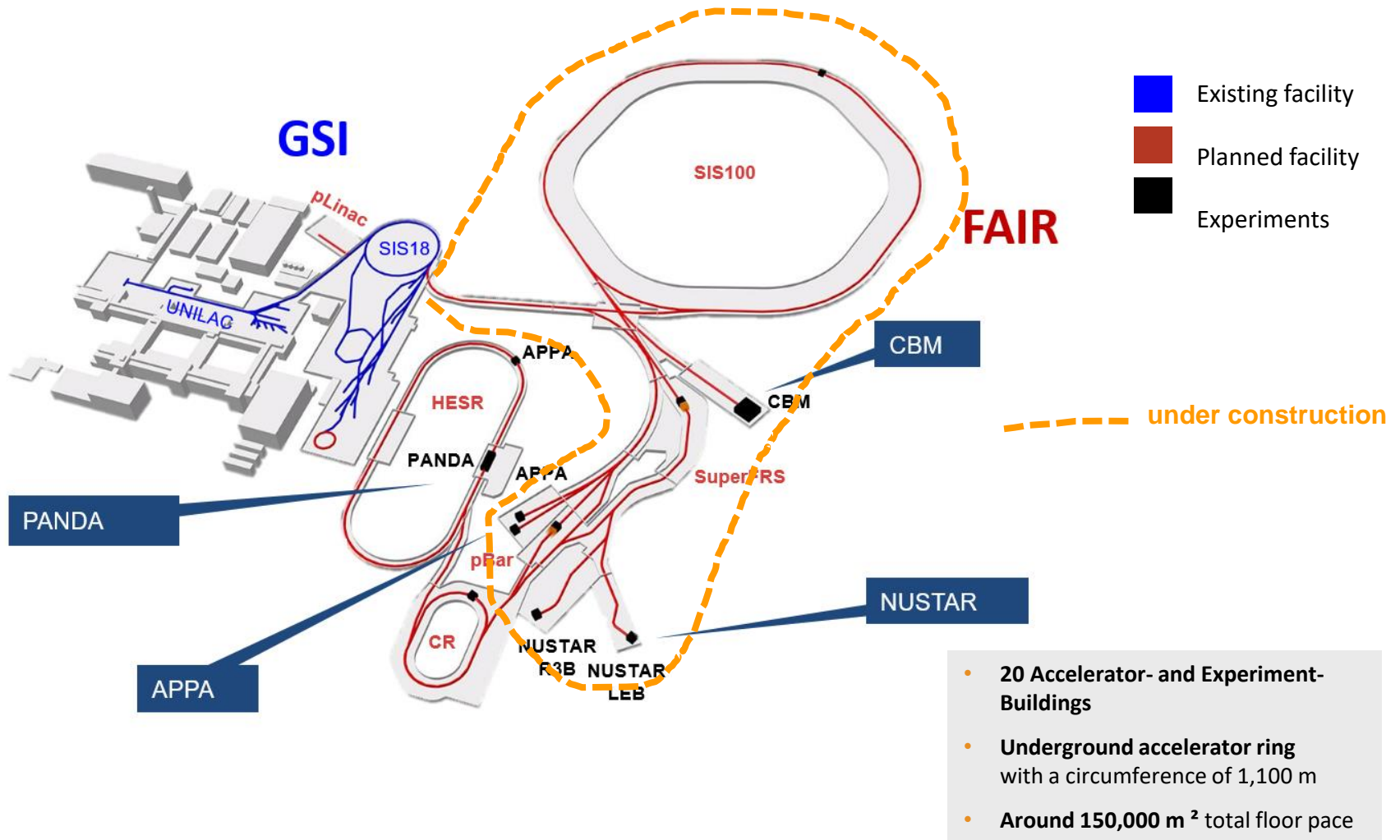
FAIR Control Center (FCC)

- main control room
- conference
- office

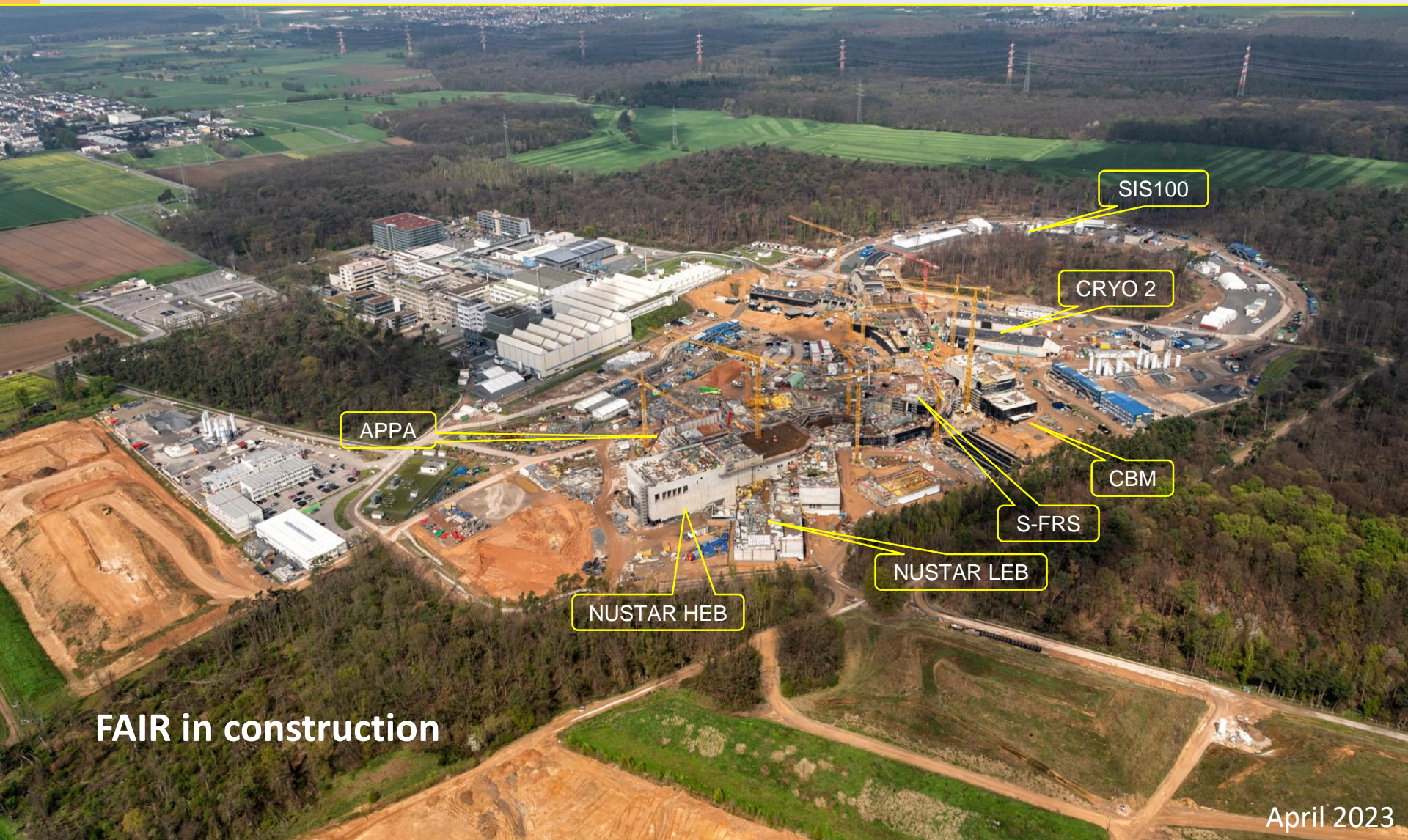


Campus Masterplan





FAIR Project Progress - Civil Construction



FAIR in construction

April 2023

FAIR Project Progress - Civil Construction

– Construction Area North



FAIR Project Progress - Civil Construction

– Construction Area South

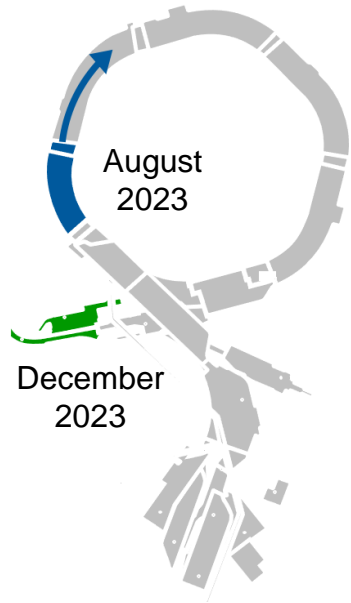


FAIR Project Progress - Civil Construction

SIS100 tunnel – TBI Installation

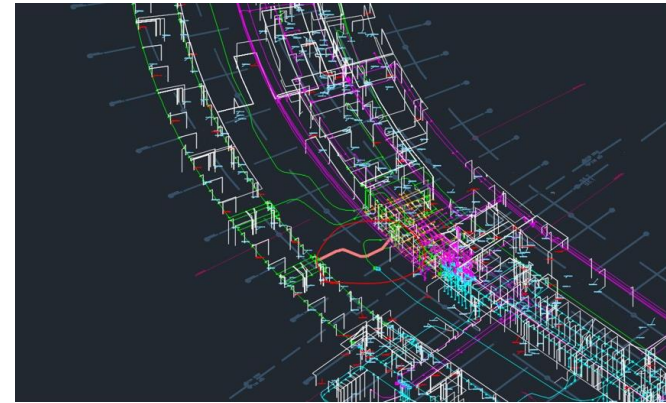


April 2023



Key data for user cable pulling:

- about 175km of cable are already on site, another 50km are being delivered shortly.
- In some cases, a large number of cables have to be bundled and pulled through an empty conduit at the same time.
- Each cable has been routed in detail and is controlled and documented via cable pull cards.
- **Start of pulling in SIS100 Tunnel in August 2023**
- **Start of pulling in HEBT Tunnel in December 2023**



Detailed cable routing planning



Preparatory cable pulling test was successfully carried out on 31.03.2023.

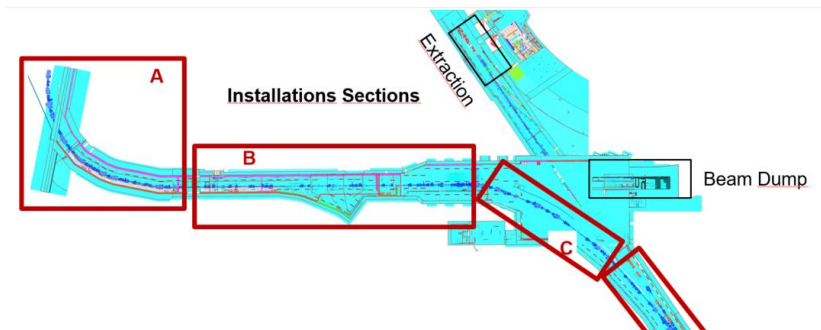
2024

Start of installation in four locations.
Preparation of resources, equipment and components is in progress.



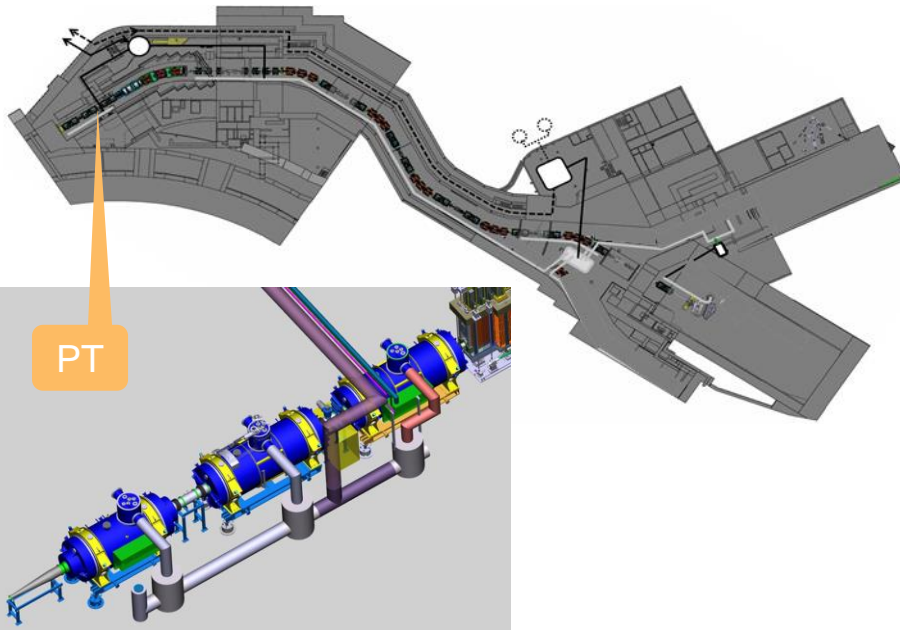
Q2 2024

HEBT ES beam line installation –
Sections in coordination with
GSI beam time and TBI installations.



Q3 - 2024

Start of Early Science Installation
in S-FRS block PT with Cryo-feed
lines from WUST.

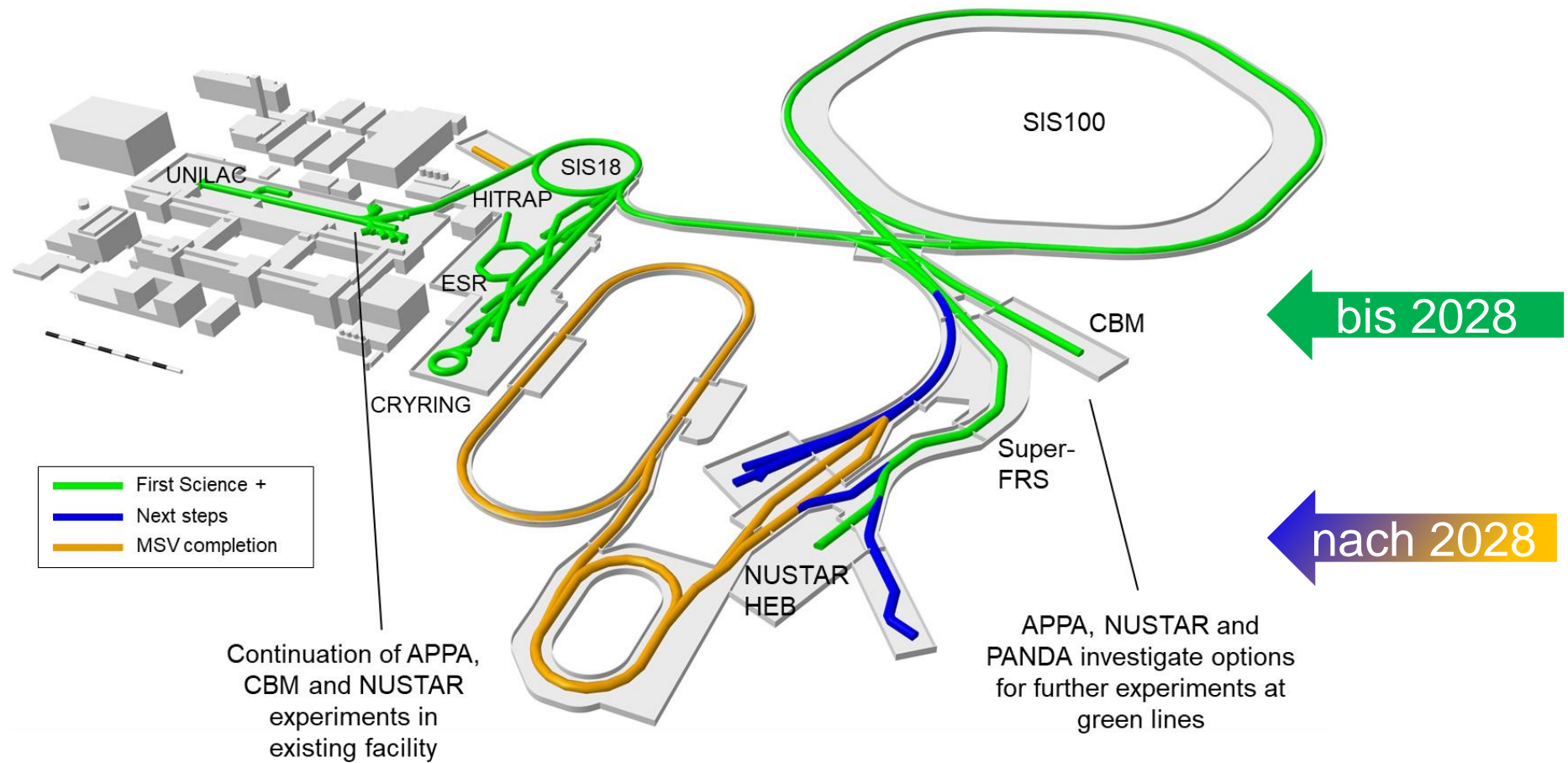


Q1 - 2024

Start of First Science Installation SIS100.
Tunnel is ready for cable pulling.



FAIR stepwise approach towards MSV



- Civil works for building shells are well in progress to be completed by end 2023.
- Start of ACC installation in Q1-2024 in preparation.
- Following FAIR Council decision in July 2023, the CBM Dipole Magnet procurement has been released paving the way towards FS+.
- Allocation of resources available from Freeze Projects to new assignments is in progress and will provide additional impact on achieving ES and FS Targets.
- Replacement purchases for In-Kind components from Russia are in progress in line with time schedule to meet the 2027/2028 deadlines.
- Following FAIR Council decision in July 2023, the pre-budget for commissioning is available enabling a timely start of related activities (Helium procurement, crane maintenance contract, Experiment fellow and associate program, computing, ...)

Thank you for your attention !

