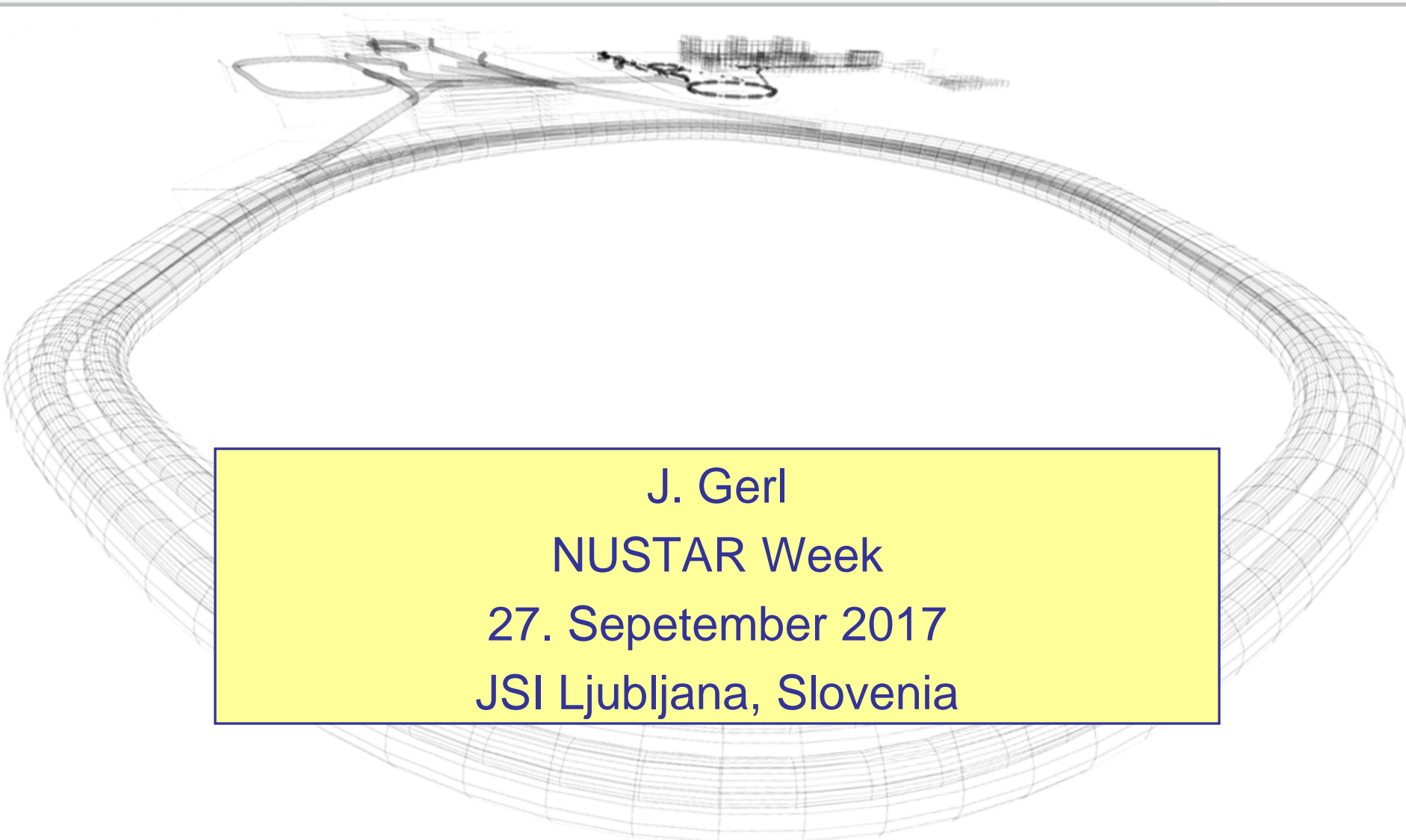


NUSTAR Project Status



J. Gerl
NUSTAR Week
27. September 2017
JSI Ljubljana, Slovenia

FAIR-NUSTAR Planning Status



- Planning scope is the MSV
- The completion date is in 2025
- Continuous progress measurement is defined and established
- Minor inconsistencies in the plans are being corrected
- Weekly, monthly and quarterly reviews are scheduled and performed
- Some deviations from the plans are observed, reducing the float but not affecting the final dates
- Cost update for Machines and Experiments has been done
- Found cost increases for machine components, additional components etc. are moderate and treated as enhanced risk for the in-kind partners

Scope of planning

ATB (Along the Beamline) - **Component List**

WBS (Work Breakdown Structure) - **Work Packages and Responsibles**

Project Plan - **Resource Loaded Time Schedule**

Cost – **GSI and Russian FAIR In-kind, all Infrastructure,**

Your input is required!!!

Please be responsive and pro-active!

Is the component list complete and what additional infrastructure is required?

Is the work package list complete, and are the work package leaders appointed and active?

What is the status (time, resources, quality) of the work packages, components, sub-systems?

Is the costing complete, up-to-date and correct?

...All documentation can be found and shall be available in EDMS

FAIR-NUSTAR Planning Facts



Planning comprises Phase-0 and Phase-1

Resources

FAIR funding requires

Approved TDR

FAIR Council assignment

Signed in-kind contract

All other funding should be based on

Approved TDR

MoU or other agreement

Schedule

FAIR planning incorporates

Experiment time plans down to level 3-4

Time plans need to be kept up-to-date

Planning includes installation at FAIR

Quality assurance

FAIR requests

Qualified FAT/SAT
(keep it as light as reasonable)

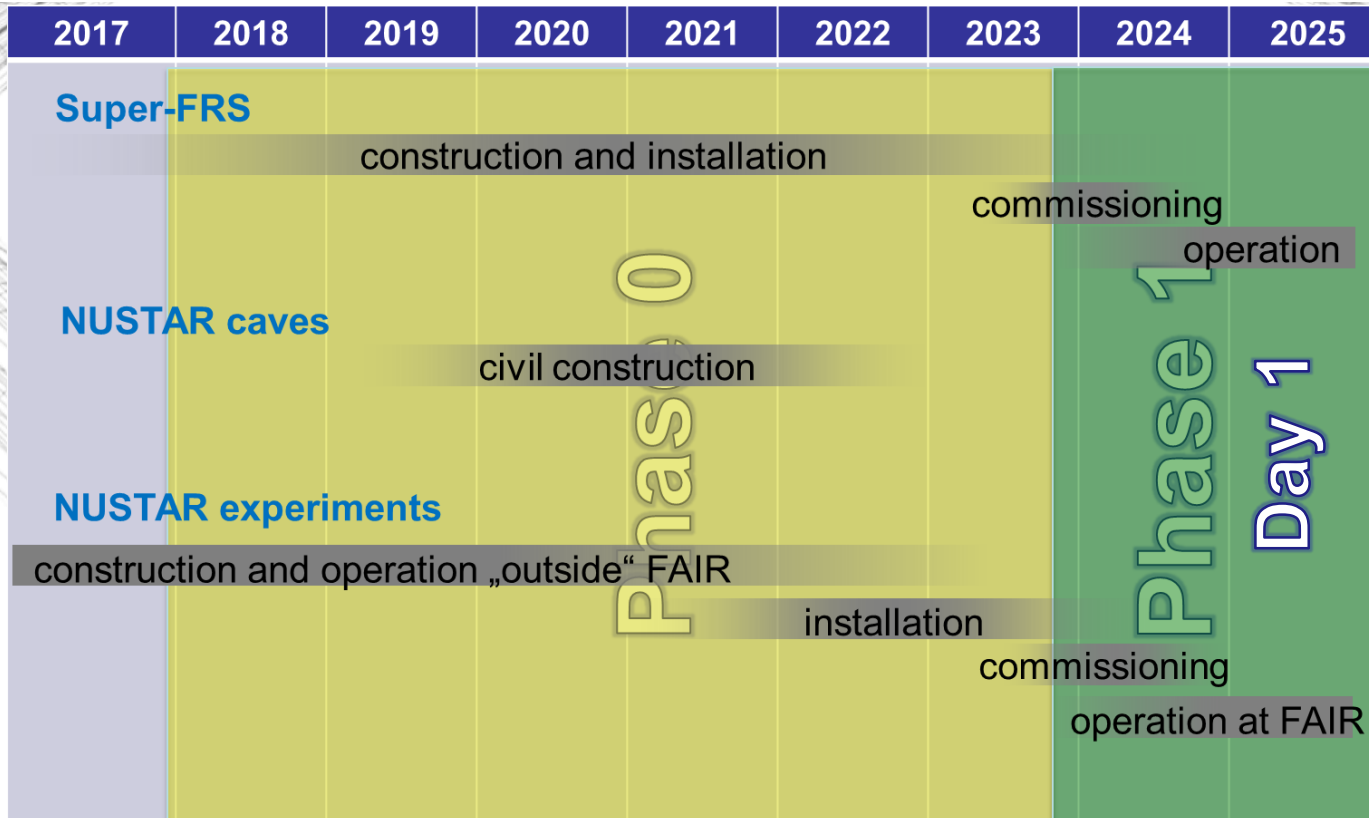
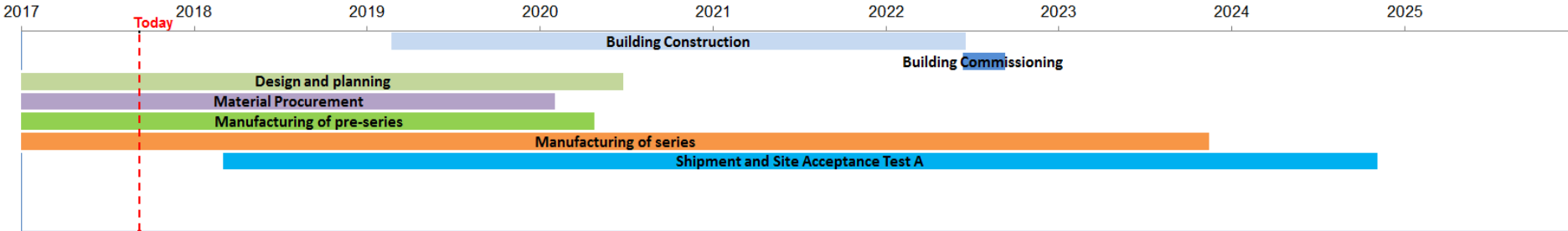
Proper documentation
(use EDMS)

Adherence to approved safety conditions

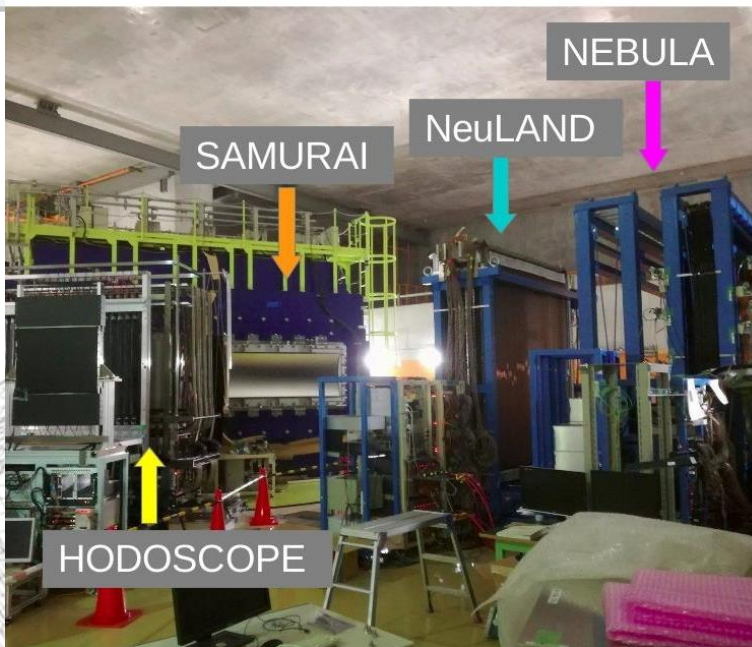
NUSTAR Overall Schedule



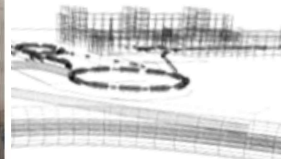
Project Schedule Overview



Recent progress (...examples only)



NEULAND in operation at RIKEN

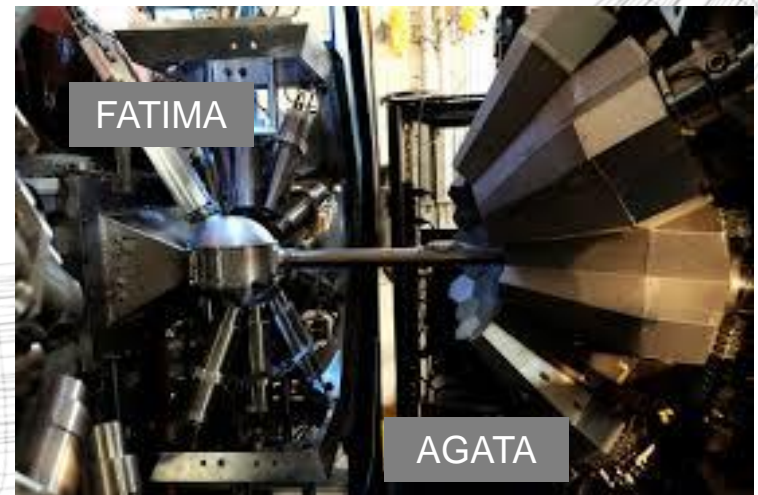


DTAS in operation at JYFL

FATIMA in operation at GANIL



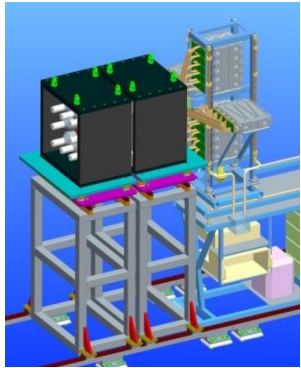
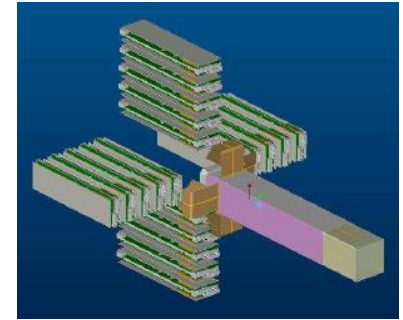
O-TPC ready to use



Ingredients for a successful DESPEC Phase-0 programme at GSI

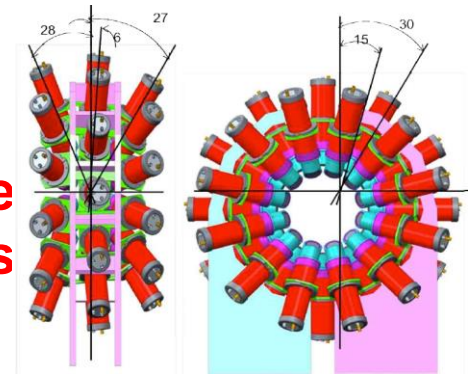


take AIDA as common active implanter

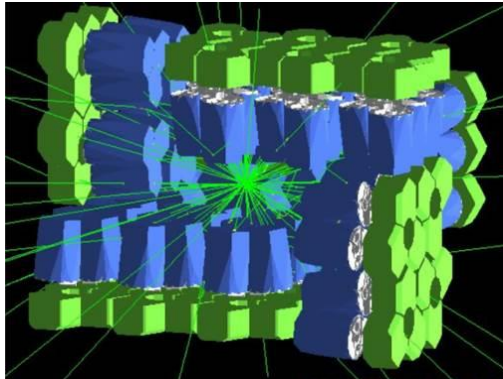


use DTAS to measure β -strength distributions

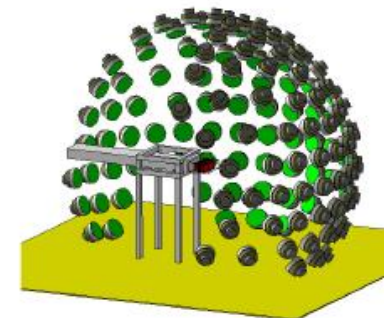
use FATIMA to measure lifetimes



use DEGAS for high-resolution spectroscopy



use MONSTER to perform neutron spectroscopy



Phase - 0 Beam time request 2018/19 at GSI



Experiment	proposals	UNILAC Shifts	SIS18/FRS Shifts	FRS/ESR Shifts
R3B	9		253	
DESPEC	9		241	
Super-FRS	9		233	
ILIMA	2			42
SHE	7	573		
		573	727	42

The present G-PAC call for 2018/19 offers approx. 600 shifts for UNILAC, 400 shifts for SIS18 and 170 shifts for ESR/Cryring

Pending TDRs and recent changes



tdr#	title	submission status	date
32	R3B Active target (ACTAF)	approved	Sep 15
38	EXPERT	approved	Sep 16
5	NUSTAR DAQ	submitted	Nov 16
26	Si tracker	expected	Jul 17
2	Cryogenic Stopping cell	expected	Jul 17
28	R3B Vacuum systems	expected	Jul 17
4	HISPEC/DESPEC infrastructure	expected	Sep 17
29	R3B Infrastructure	expected	Sep 17
35	Decay detectors	expected	Sep 17
1	LEB Super-FRS Infrastructure	expected	Nov 17
7	Active target (India)	expected	Nov 17
8	HYDE charged particle detectors for reaction studies (HISPEC)	expected	Nov 17
18	Isomeric moments (DESPEC)	expected	Nov 17
33	Schottky pick-ups	expected	Nov 17
34	Time-of-flight detectors	expected	Nov 17
30	R3B Spectrometer	expected	Mai 18
37	Slowed down beam setup	expected	Nov 19

„Day-1“

Remaining 14 of 38 TDRs to be submitted by Nov. 2019

Cost and Procurement



- NUSTAR experiment costs remain stable
- Spending follows closely available funding
- Funding of start version (day-1) of Phase-1 secured to $\approx 90\%$
- List of yet unassigned (missing) items has been prepared. Most identified items can be covered by pre-defined generic components (e.g. "Safety"). Therefore the risk of a cost overrun at a later stage is moderate
- **Decision on assignment of ill-assigned items requested**



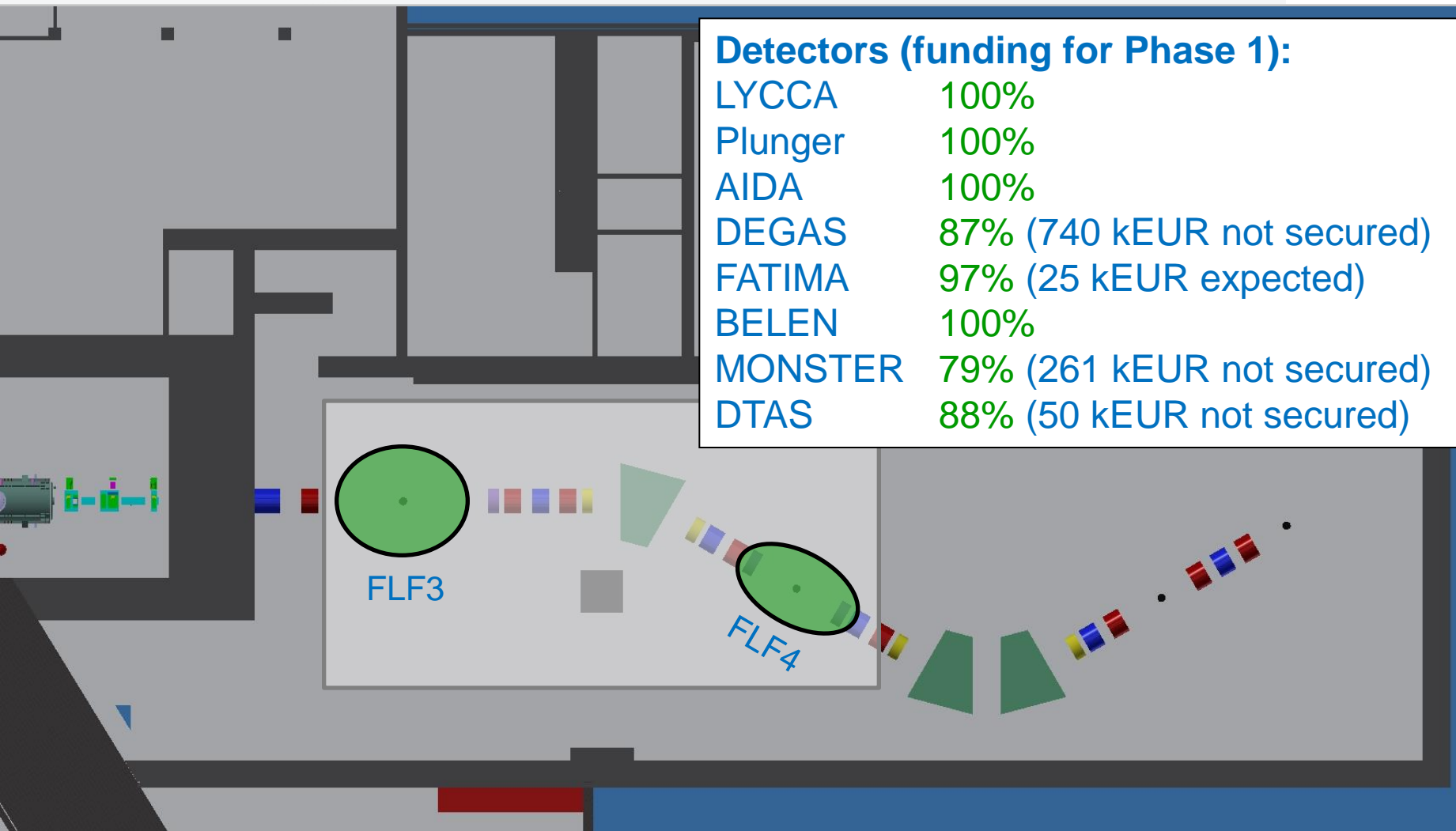
FAIR NUSTAR JG

HISPEC/DESPEC – funding status (Phase 1)

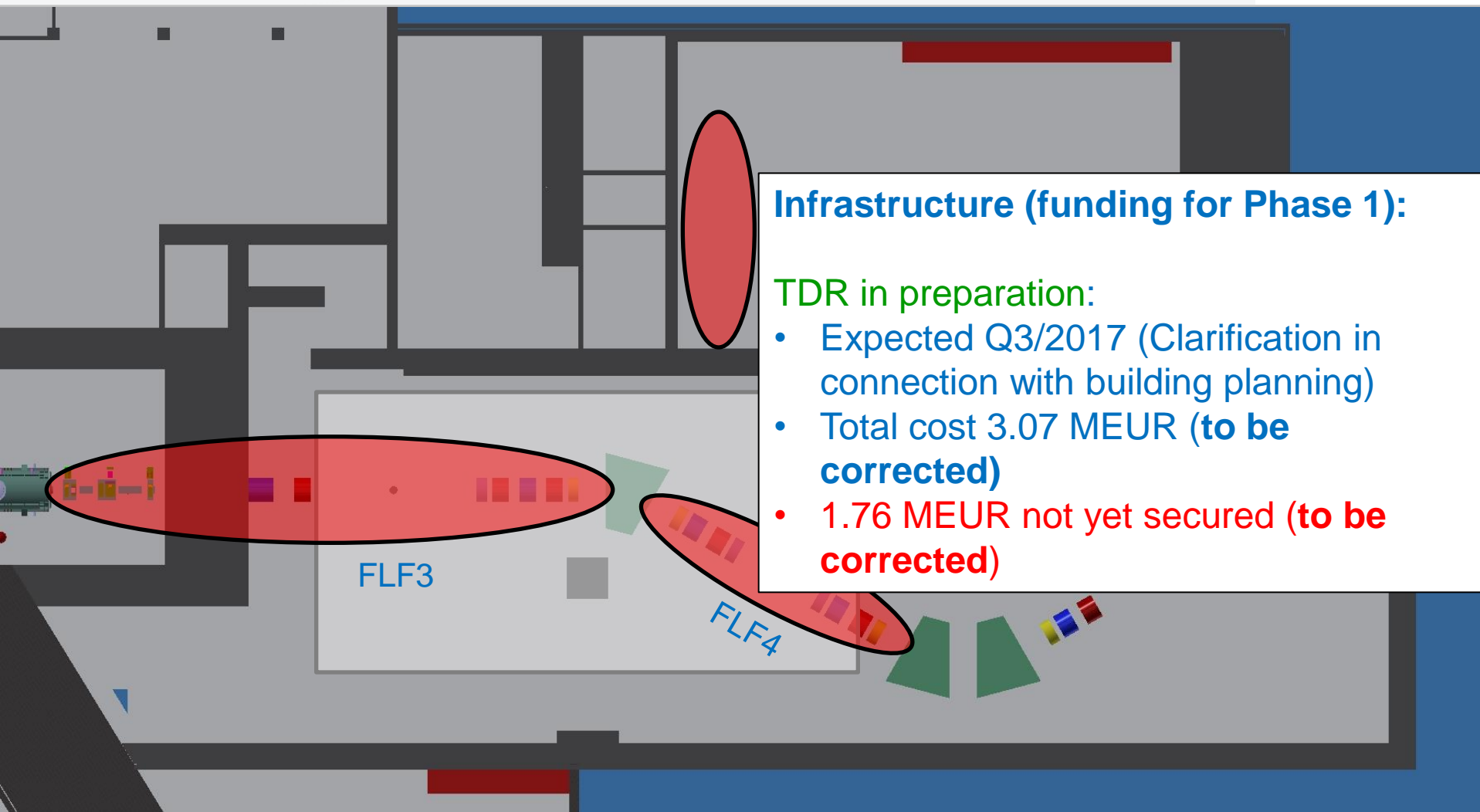


Detectors (funding for Phase 1):

LYCCA	100%
Plunger	100%
AIDA	100%
DEGAS	87% (740 kEUR not secured)
FATIMA	97% (25 kEUR expected)
BELEN	100%
MONSTER	79% (261 kEUR not secured)
DTAS	88% (50 kEUR not secured)



HISPEC/DESPEC – funding status (Phase 1)



Infrastructure (funding for Phase 1):

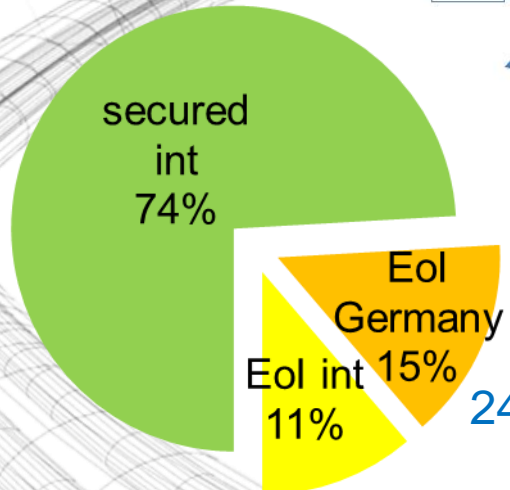
TDR in preparation:

- Expected Q3/2017 (Clarification in connection with building planning)
- Total cost 3.07 MEUR (**to be corrected**)
- 1.76 MEUR not yet secured (**to be corrected**)

R³B – CALIFA funding status

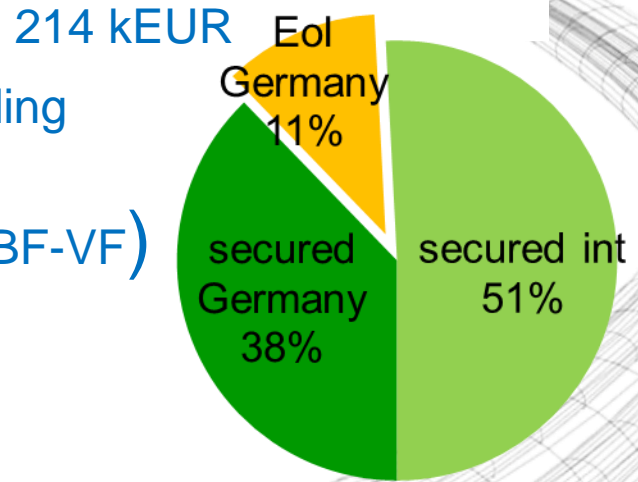


CALIFA fwd endcap



additional funding from Germany expected (BMBF-VF)
246 kEUR

CALIFA barrel stage 1+2



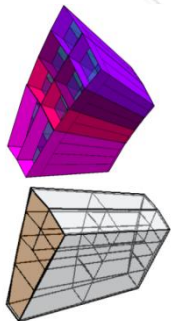
Barrel stage 1+2 (Germany, Spain, Sweden)

iPhos Stage 1 and 2

CEPA

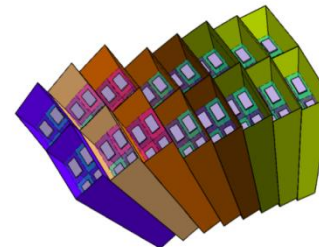
Barrel Stage 1 and 2

Barrel Stage 3

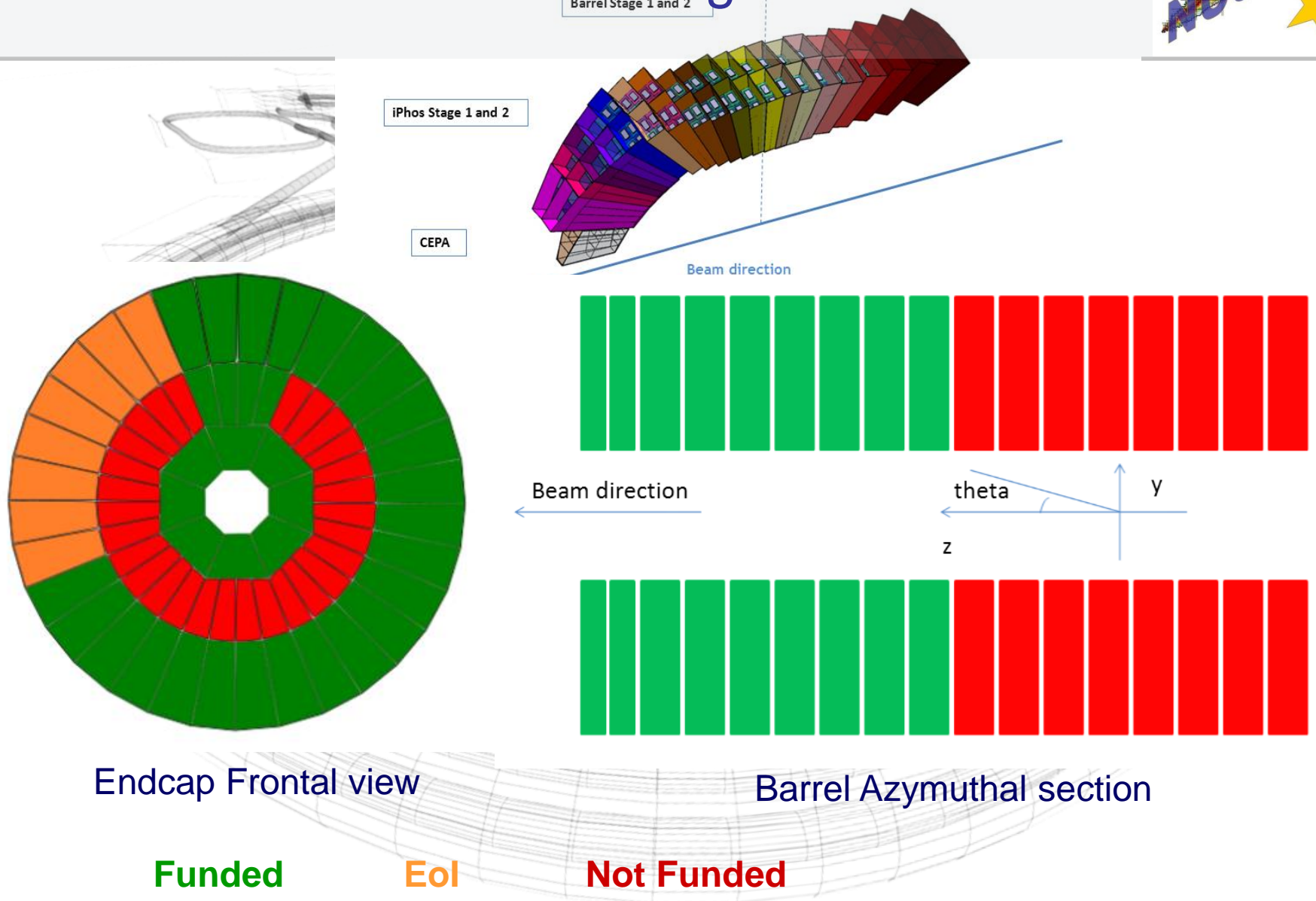


Forward endcap iPhos (Germany, Russia, Spain)

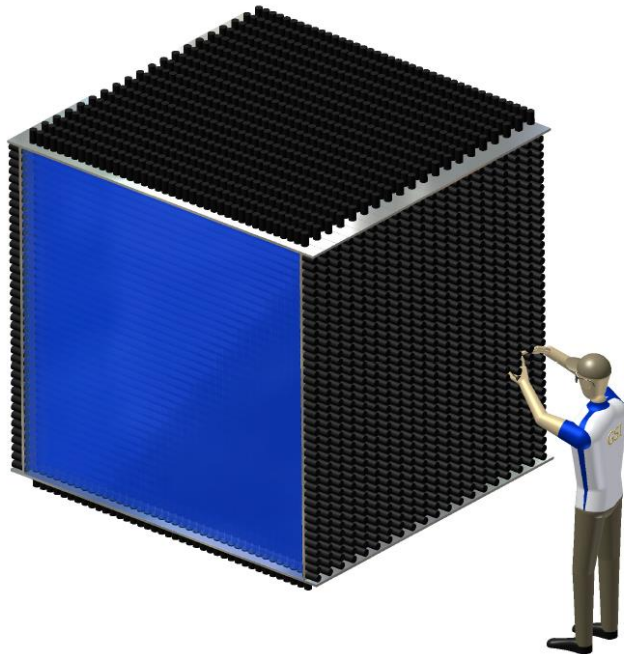
Forward endcap CEPA (Sweden)



R³B – CALIFA funding status



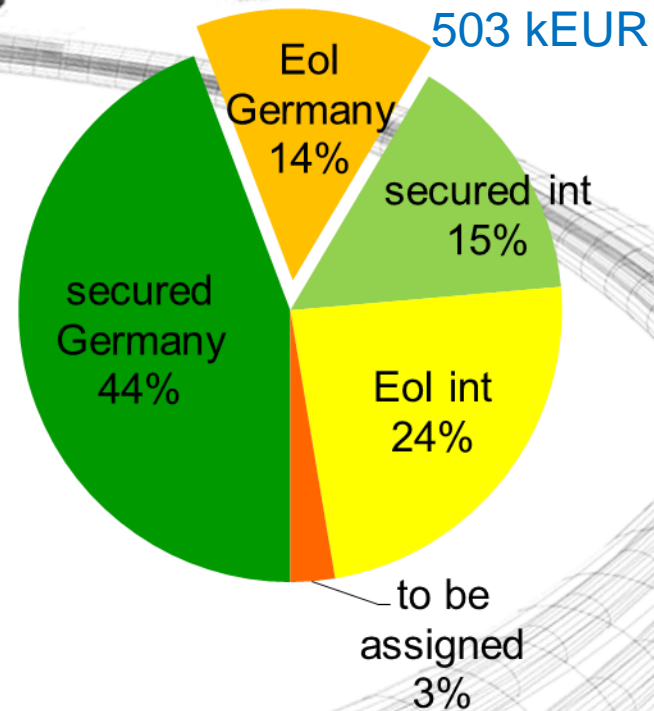
R³B – NeuLAND funding status



Full system = 30 double planes

- 2 x 50 paddles each
- 5 x 5 x 250 cm³
- RP408 / R8619ASSY
- FPGA TDC readout

NeuLAND stage 1+2



- **13 out of 22 double planes for NeuLAND stage 1+2 funded**
- 3 more double planes expected from German funding (BMBF-VF)

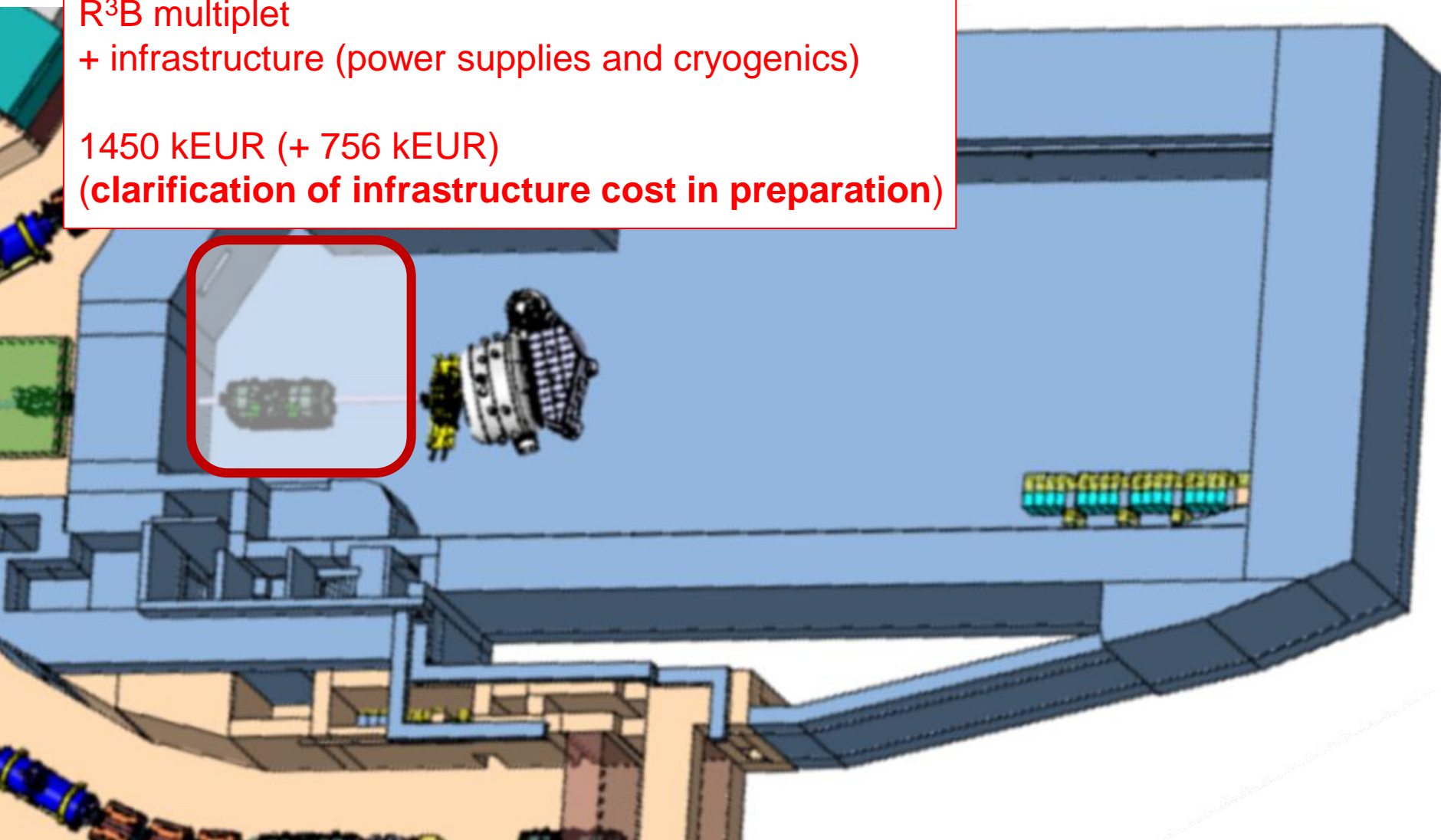
R³B in high energy cave

Critical item:

R³B multiplet
+ infrastructure (power supplies and cryogenics)

1450 kEUR (+ 756 kEUR)

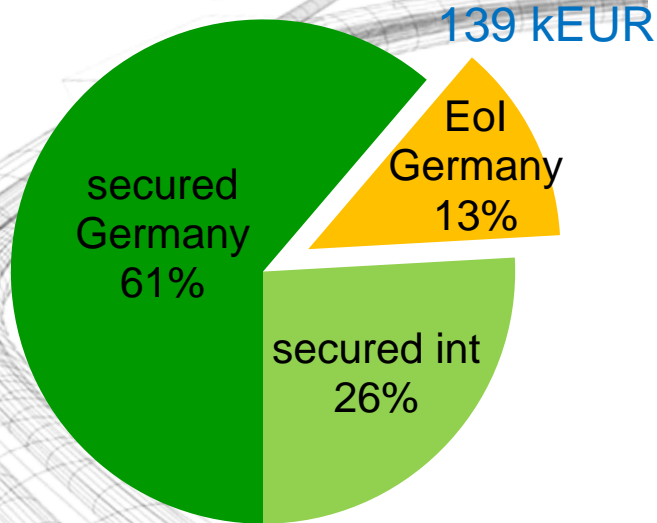
(clarification of infrastructure cost in preparation)



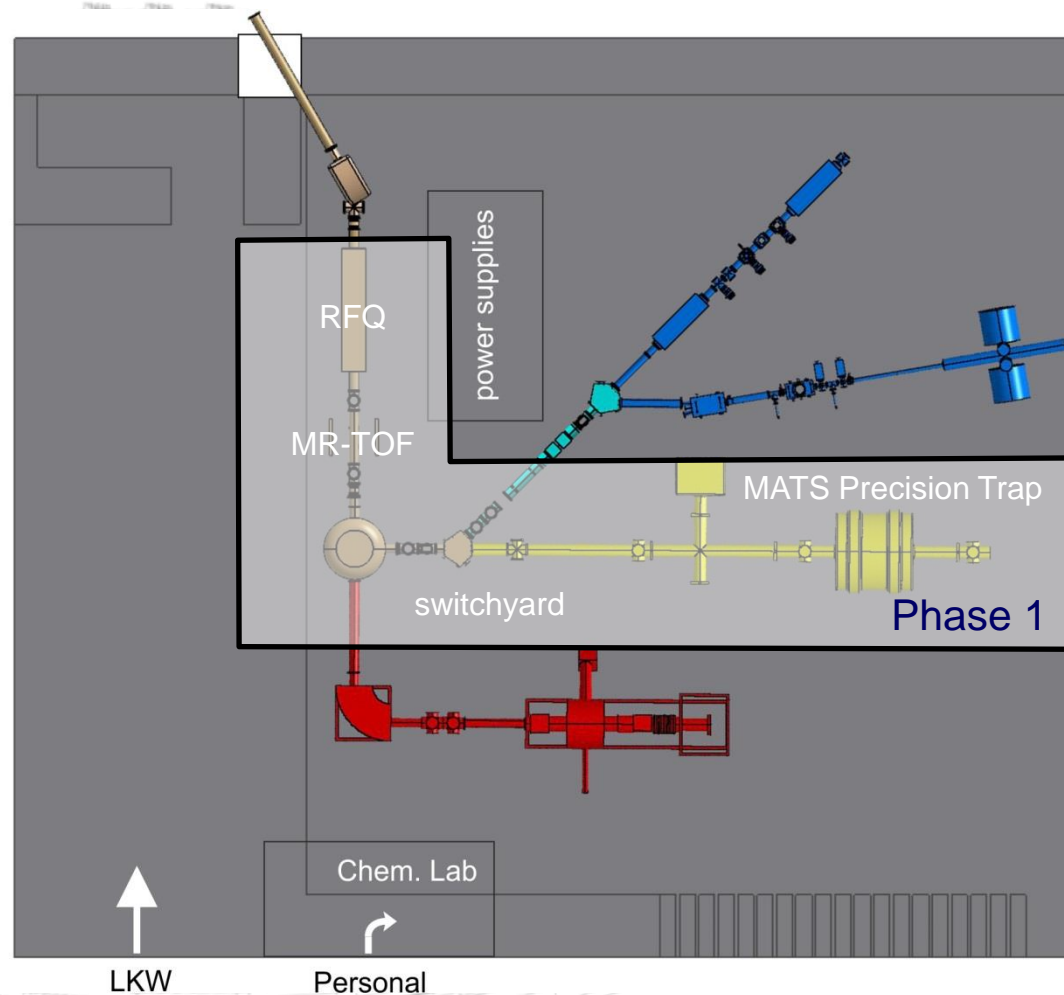
MATS – funding status



MATS Day-1 setup



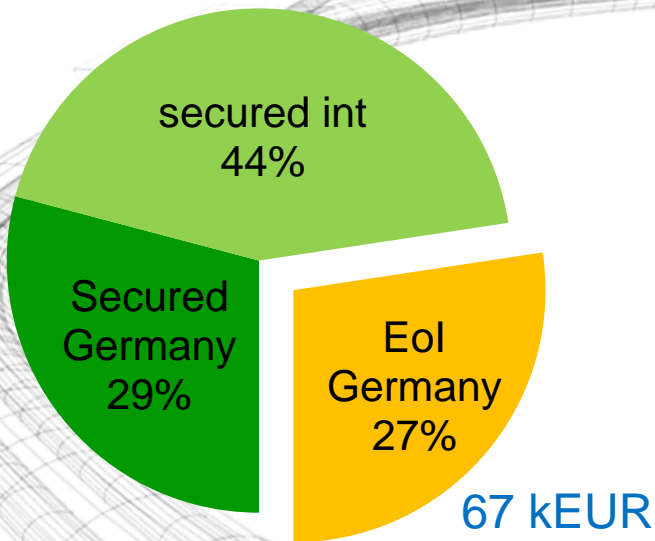
Additional funding from Germany (BMBF-VF) for the completion of the Day-1 setup expected (139 kEUR).



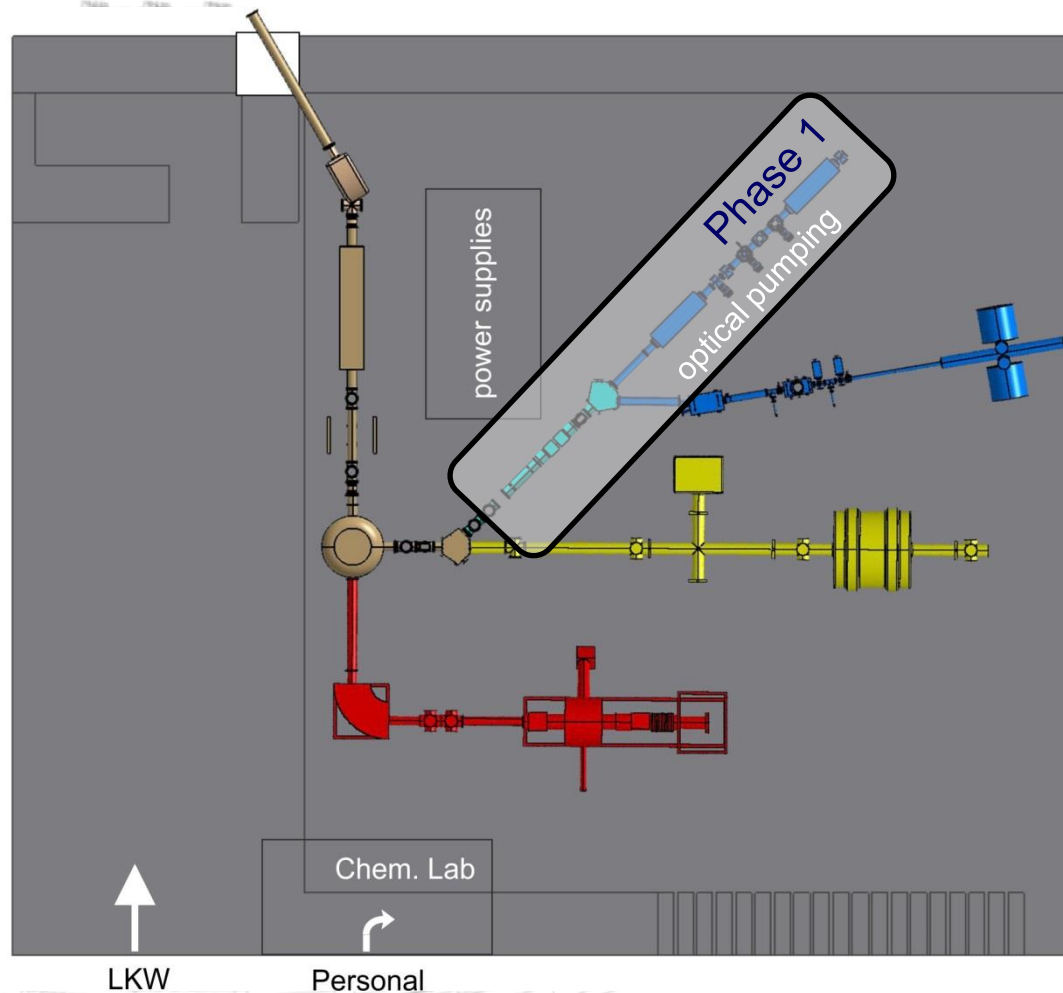
LaSpec – funding status



LaSpec Day-1 setup



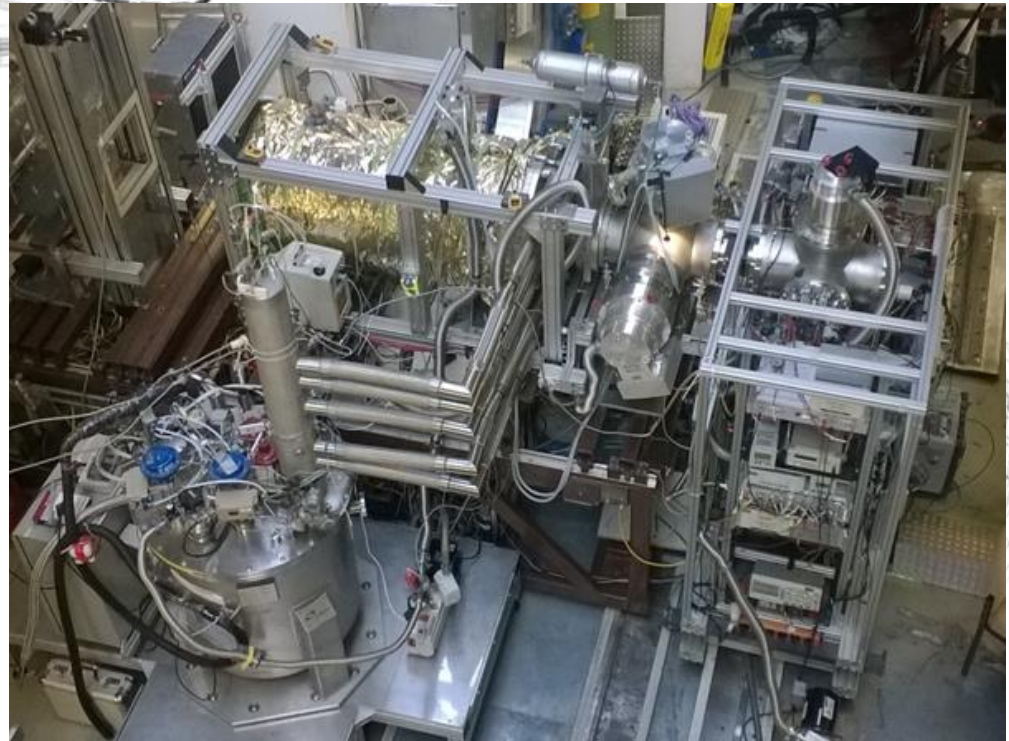
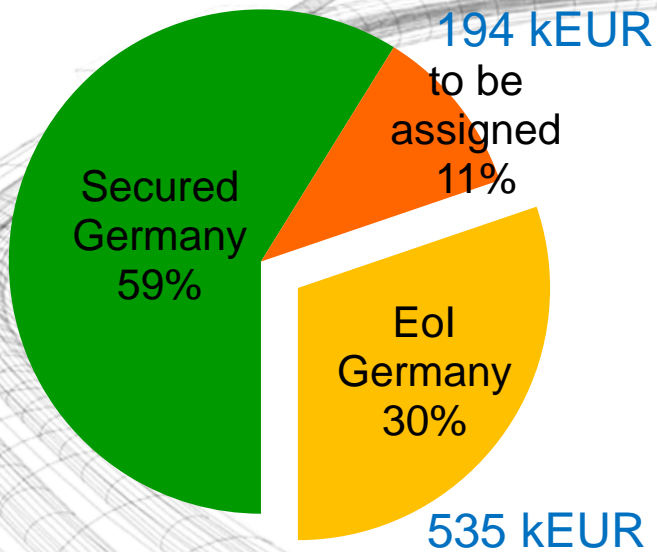
Additional funding from Germany (BMBF-VF) for the completion of the Day-1 setup expected (67 kEUR).



LEB Cryogenic Stopping Cell



CSC



TDR expected Q3/2017

prototype coupled to the MR-TOF

How to get the missing funds?



-Continue fund raising efforts

-New idea: Get (infrastructure) items through NUSTAR common funds

Is planned to be asked by NUSTAR, replacing experiment common fund requests

Requires updated NUSTAR MoU

-Find additional partners

Critical path



- LEB Buncher/Spectrometer (Super-FRS PSPs, but taken care by NUSTAR)
 - CDR severely delayed, new version received on August 4, 2017
 - Affects DESPEC, HISPEC, LASPEC and MATS

Order	Criticality	PSP-Number	Component Name	Finish Date (M10)	Measures to expedite / Comments
1	critical	1.2.5.1.1.1	R3B multiplet	07/2023	Produced together with other Super-FRS multiplets, however, funding unclear. Under discussion if moved to accelerator. Without the multiplet no beam for R3B experiment.
2	next-to-critical	1.2.1.2	Cryogenic stopping cell	06/2023	TDR in preparation, clarification of cost to find new partners and funding (about 50% funded, prototype available)
3	2-to-critical	1.2.5.1.2.3.1/2	CALIFA	11/2023	Need to find required funding to complete system on time (50% missing). Only limited use of partly built detector.

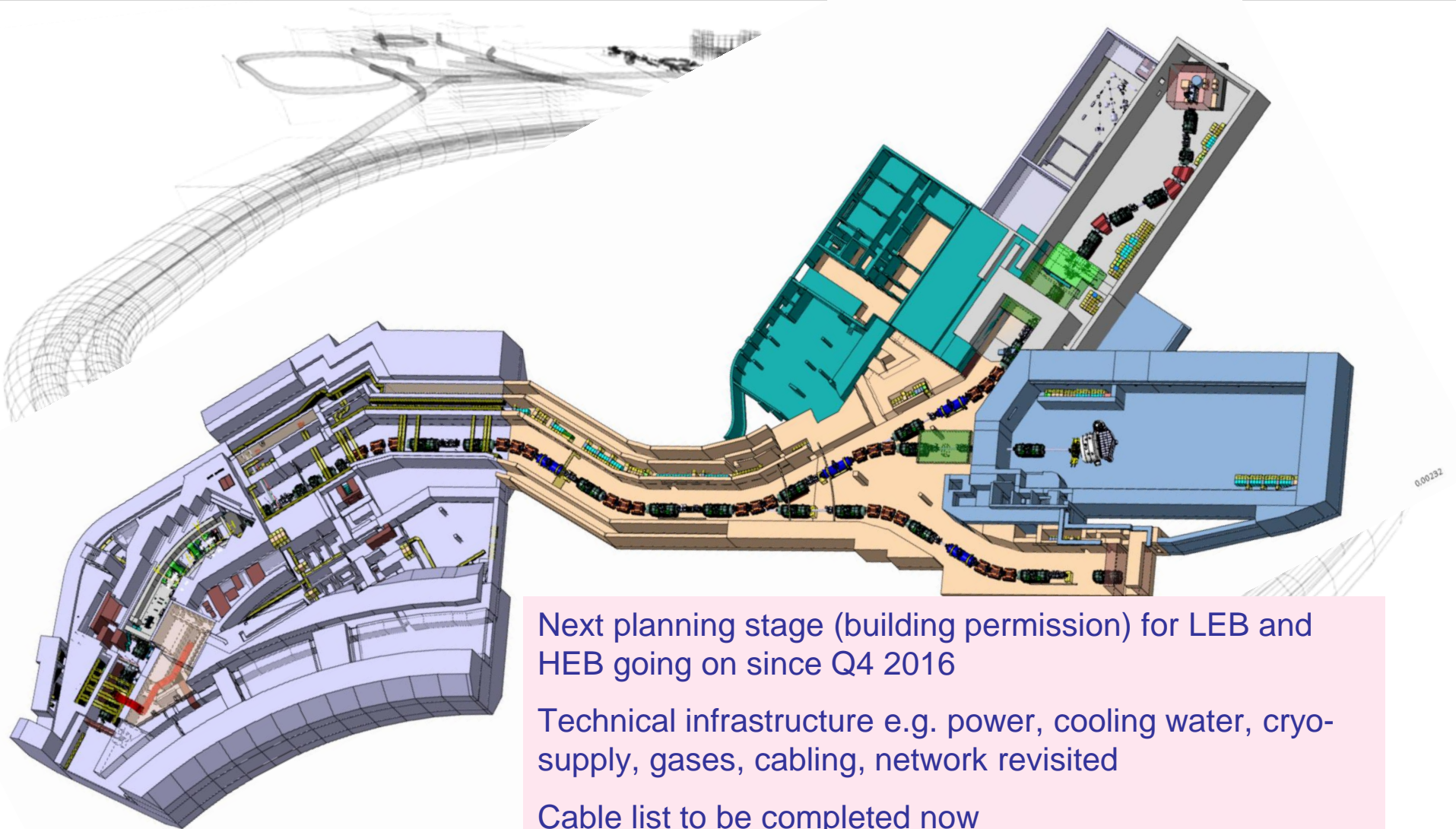
Risk & Opportunities



- Risk evaluation process under development
- Main risks:
 - Insufficient manpower for project related tasks
 - Insufficient funding of infrastructure items
 - Cost overrun of instrumentation
 - Aging of electronics and infrastructure
- Opportunities:
 - Early scientific results from Phase-0 experiments
 - Attracting new collaborating partners
 - Cost saving by technology advancement



Super-FRS and NUSTAR caves



Next planning stage (building permission) for LEB and HEB going on since Q4 2016

Technical infrastructure e.g. power, cooling water, cryo-supply, gases, cabling, network revisited

Cable list to be completed now

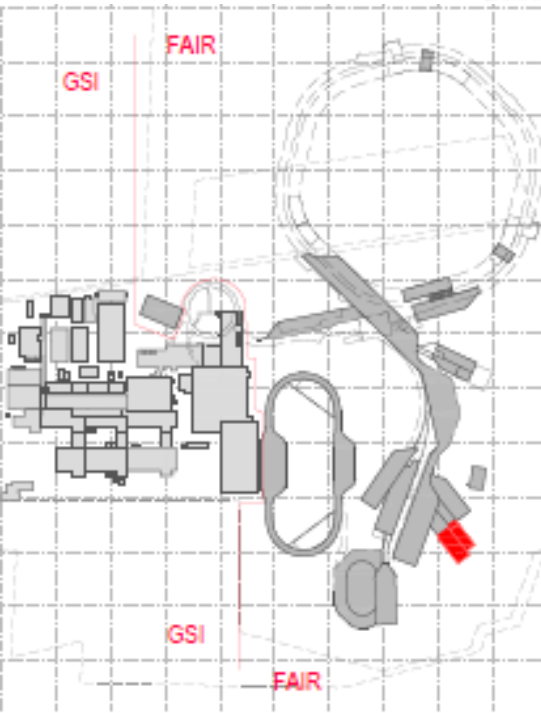
LEB Buncher/Spectrometer CDR delayed (critical path)

0.00232

LEB Building B006b



Construction permission planning and site preparation on-going



First NUSTAR activities on the FAIR construction site: To be able to build the LEB cave, part of the site road and the adjacent media lines are currently being relocated. Our building will be erected in the red-shaded area.

Objectives for the next 18 months



- Submission of remaining TDRS for Phase-1 and -2
- Consolidation of funding profile
- Finalization of In-kind contracts
- Acquisition of new collaborators and funding opportunities
- Renewal of construction and operation MoU
- Introduction of invest funding by NUSTAR common funds
- Refining of project planning
- Work off infrastructure tasks according to planning

