# RICH 2025
# 12th International Workshop on Ring Imaging Cherenkov Detectors

## Welcome from GSI/FAIR

***Thomas Nilsson***
***Scientific Managing Director GSI/FAIR***

# GSI – Facts and Numbers

- **GSI Helmholtzzentrum für Schwerionenforschung**
- Founded in 1969
- Campus Darmstadt
  - Budget (core-financed, 2023): 153.3 Mio €
  - Employees (2023): 1,550 (thereof 1,150 scientific personnel)
  - Users of the GSI facilities: more than 1,500 per year

- **Mission:**
  - Fundamental and applied research with heavy ions.
  - Development, construction and operation of heavy-ion accelerators and experimental facilities.
  - Research in hadron, nuclear, atomic, plasma physics, materials research, biophysics and heavy-ion therapy
  - Forefront developments and innovations in accelerator, laser, detector and IT technologies

- **Two outposts**: Helmholtz Institute Jena and Mainz

# GSI – Facts and Numbers

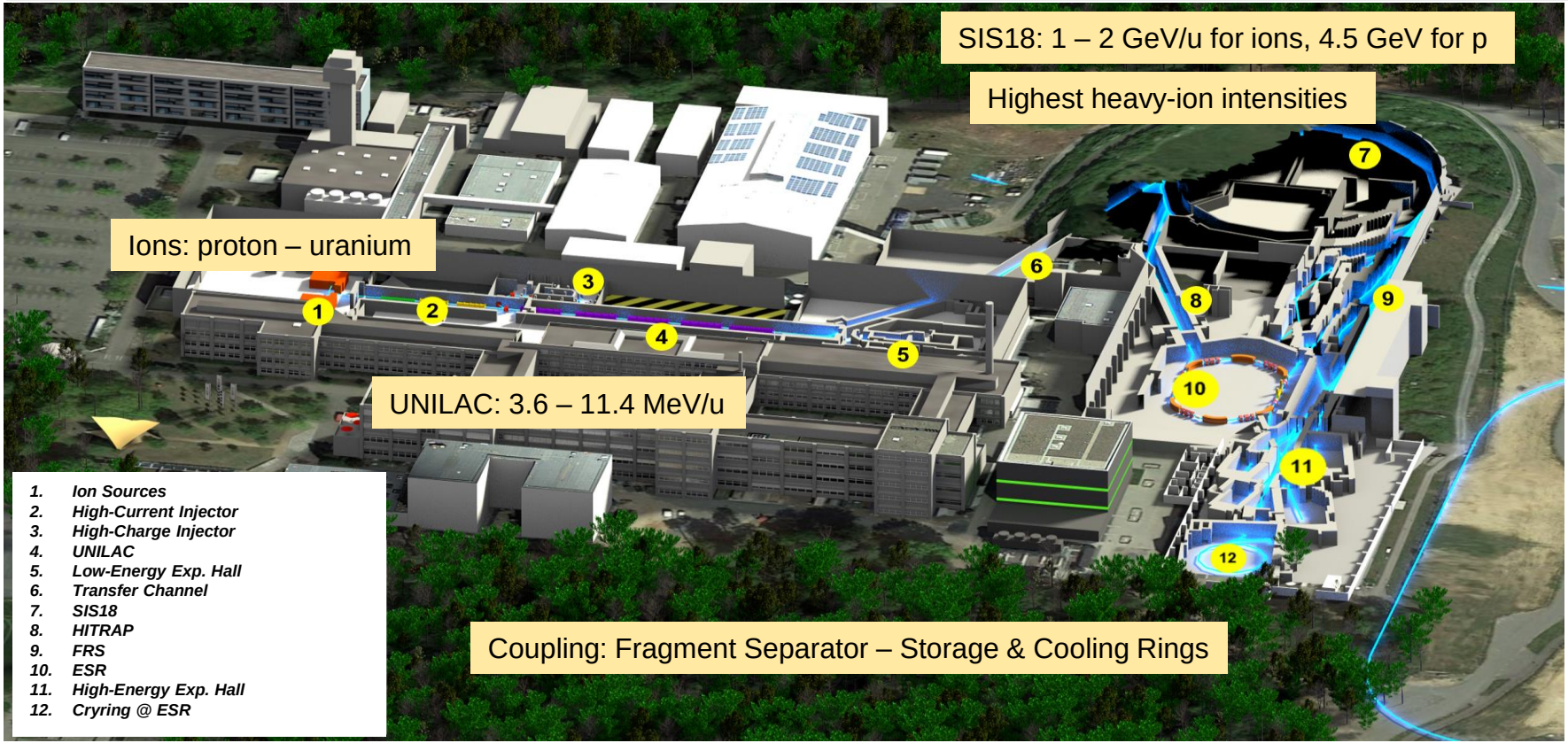

## Helmholtz Institute Jena (HI Jena)

- Founded in June 2009
- Affiliated to Friedrich Schiller University Jena
- Budget (2023): 6.9 Mio €
- Employees (2023): 65
- Expertise: fundamental physics, high-power lasers, laser-particle acceleration, X-ray technologies

## Helmholtz Institute Mainz (HIM)

- Founded in June 2009
- Affiliated to Johannes Gutenberg University Mainz
- Budget (2023): 6.9 Mio €
- Employees (2023): 50
- Expertise: fundamental physics, strong interaction, superheavies, s.c. accelerators and detector technology

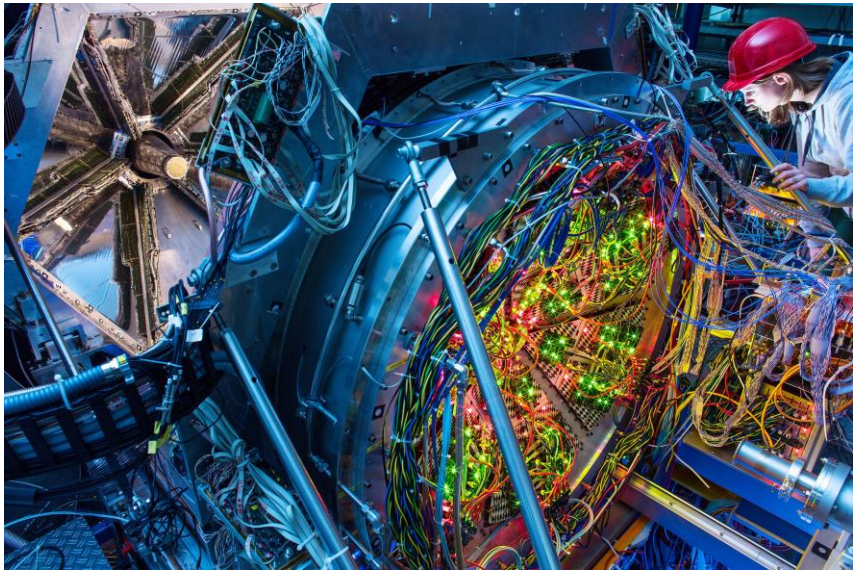
# GSI: Unique Accelerator Complex for Heavy Ions



# … with cutting-edge instrumentation

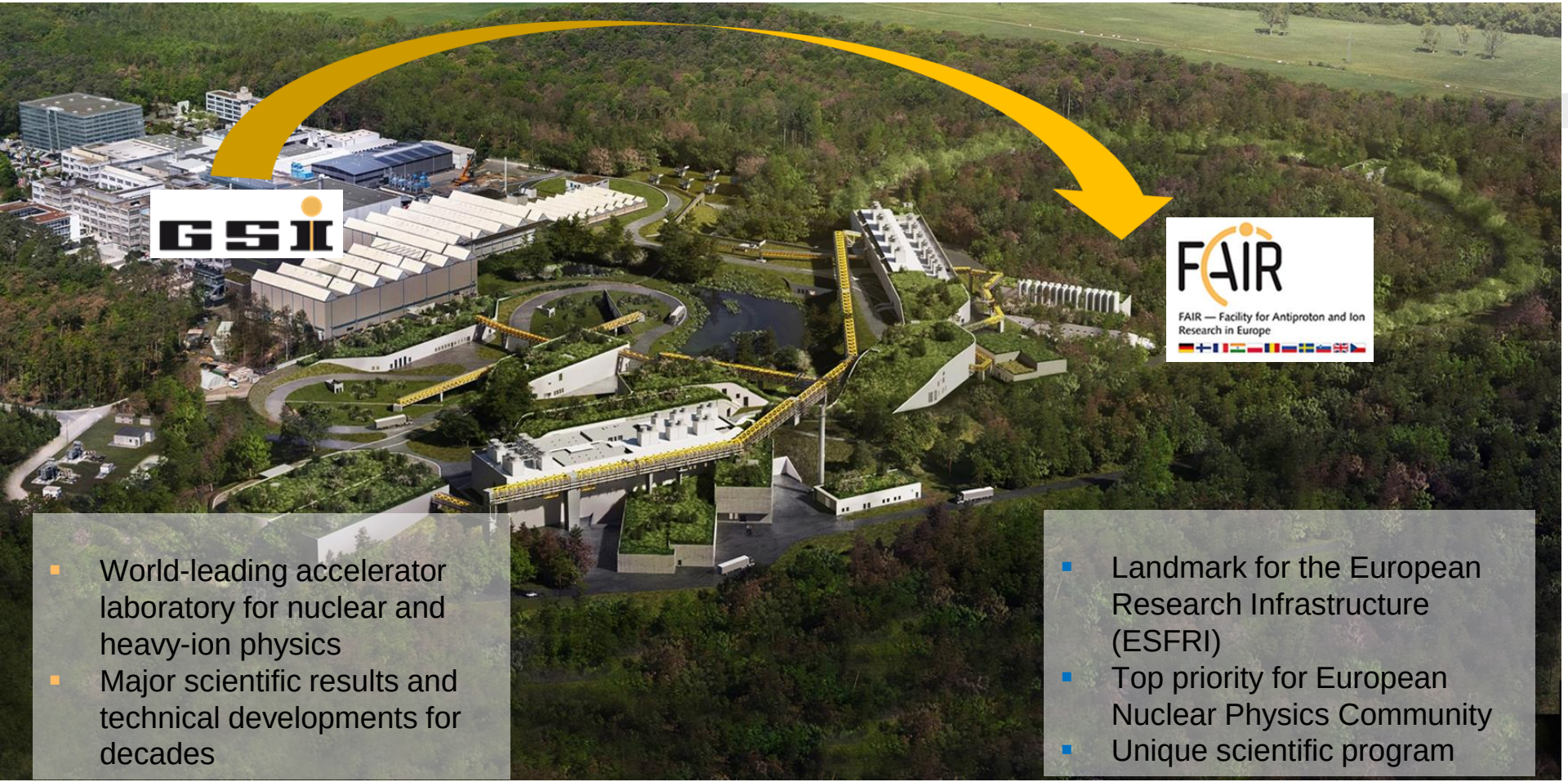
## CALIFA@R$^3$B

## HADES



# Forefront IT Developments

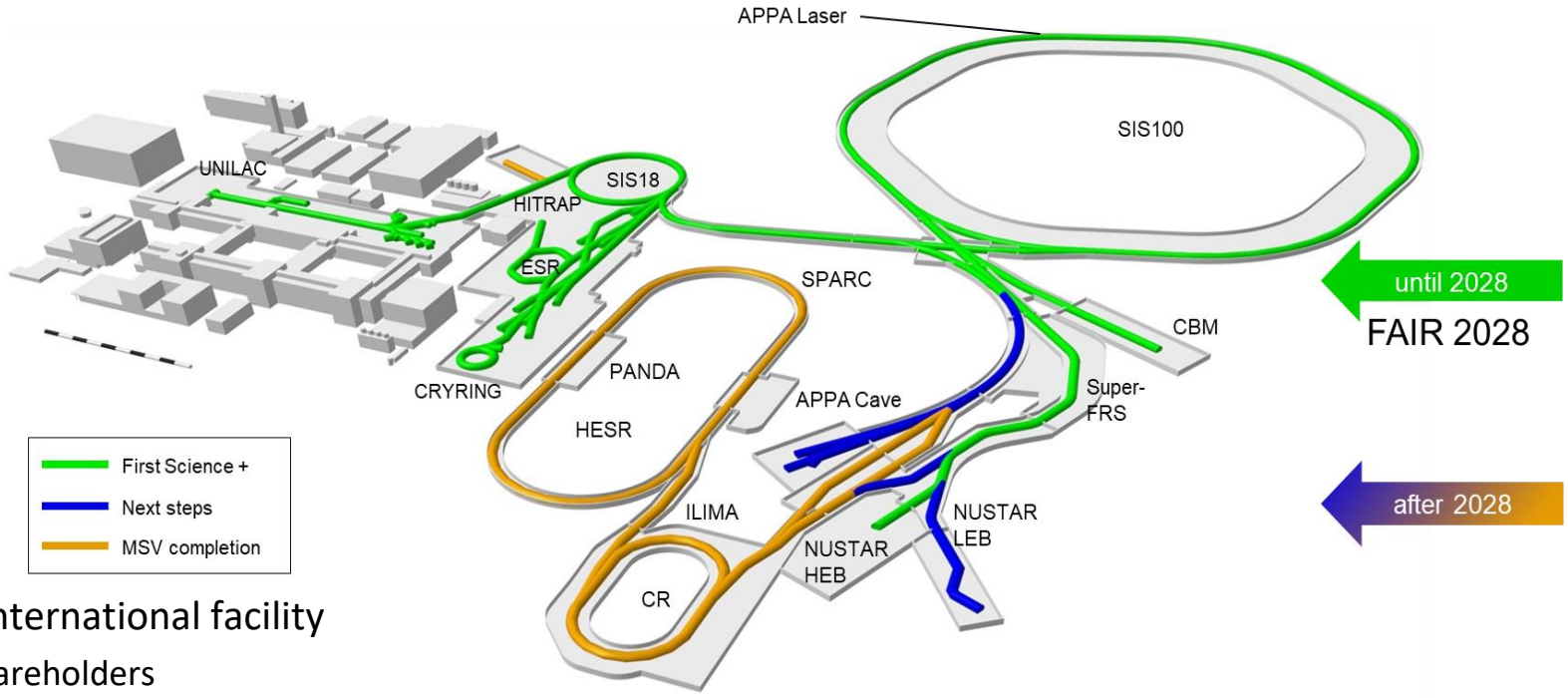

- Green IT & Big Data
- Energy-efficient high-performance computing
- AI innovation lab of the Hessian Center for Artificial Intelligence (hessian.AI)
- 600 nodes/54.000 cores/400 GPUs (2023)




- World-leading accelerator laboratory for nuclear and heavy-ion physics
- Major scientific results and technical developments for decades

- Landmark for the European Research Infrastructure (ESFRI)
- Top priority for European Nuclear Physics Community
- Unique scientific program

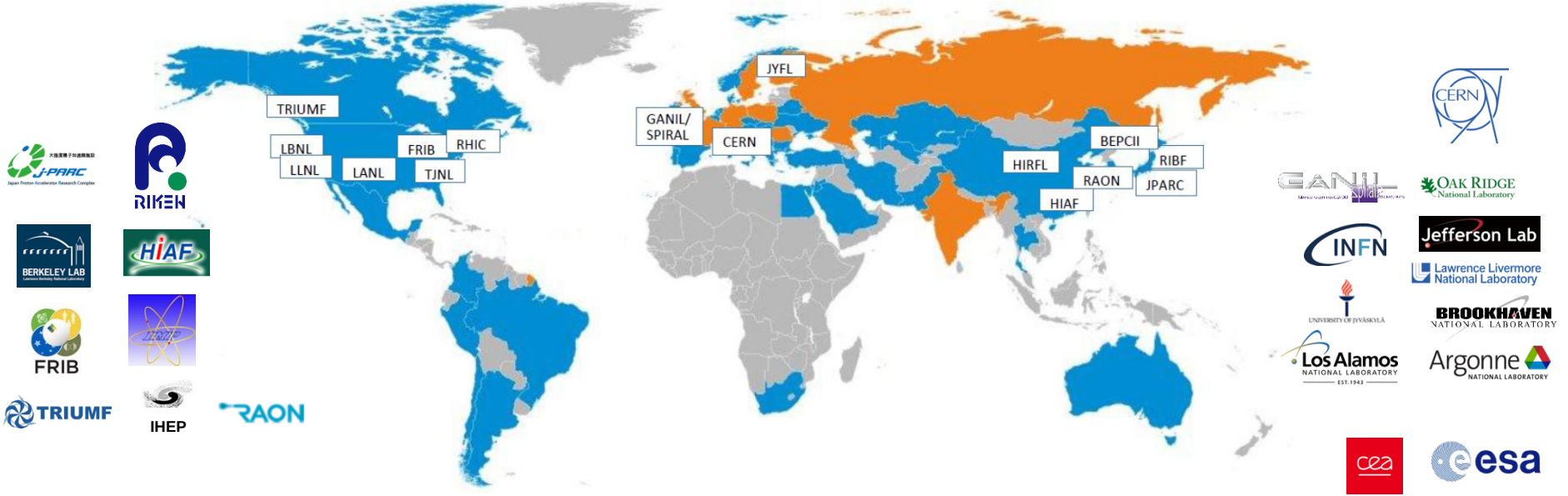
# FAIR – Facility for Antiproton and Ion Research




FAIR international facility

- 9 shareholders
- + 1 associated partner
- + 1 aspirant partner

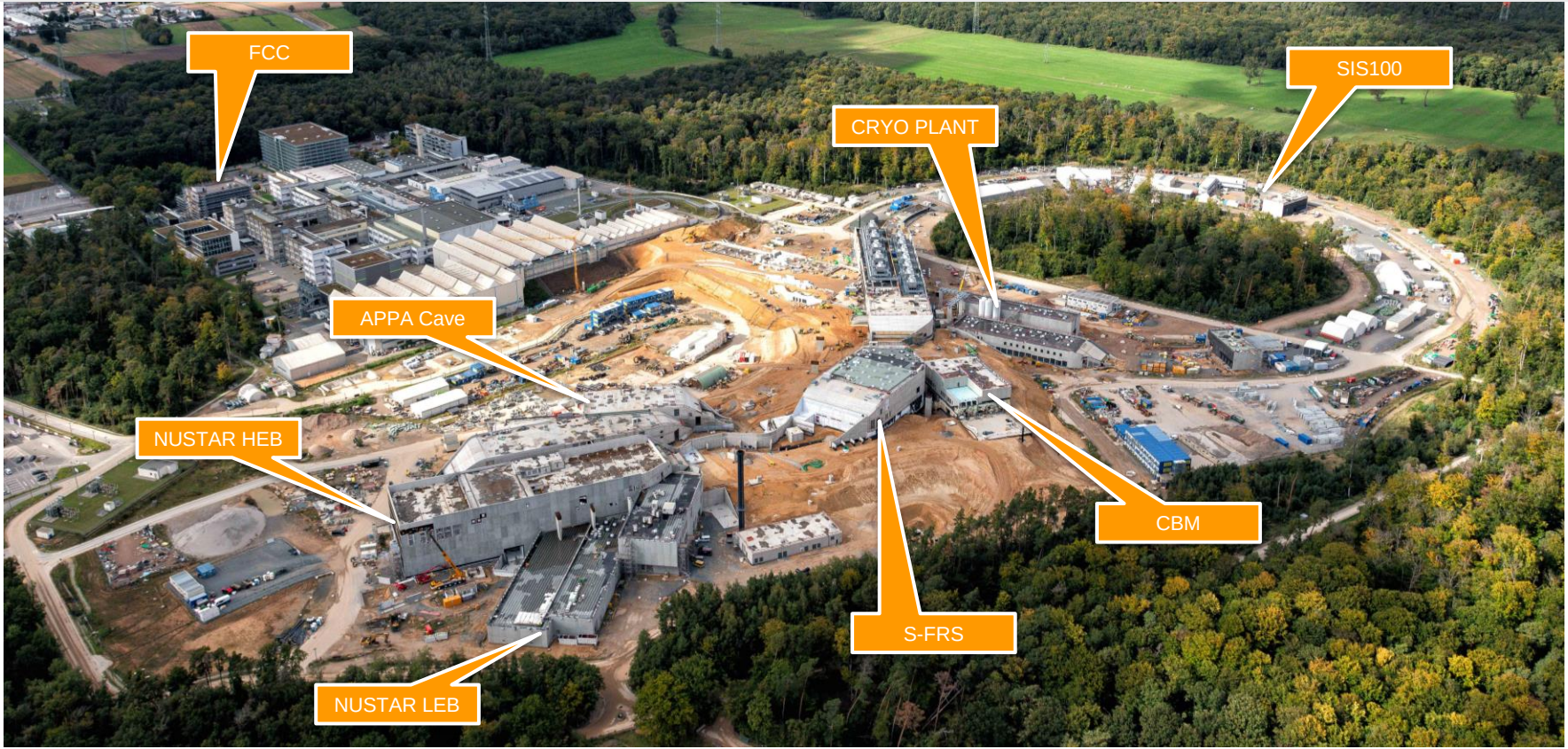
# Worldwide Collaboration & Competition




- With major research facilities / institutions / projects from all over the world
- With Scientists from more than 200 institutions from 53 countries (Orange + Blue)
  - **Orange:** countries, which are shareholders of FAIR
  - **Blue:** countries contributing to research and technical development projects at GSI and FAIR
- In total more than 3000 scientists and engineers are involved in R&D for GSI and FAIR

# FAIR Project Progress – Civil Construction

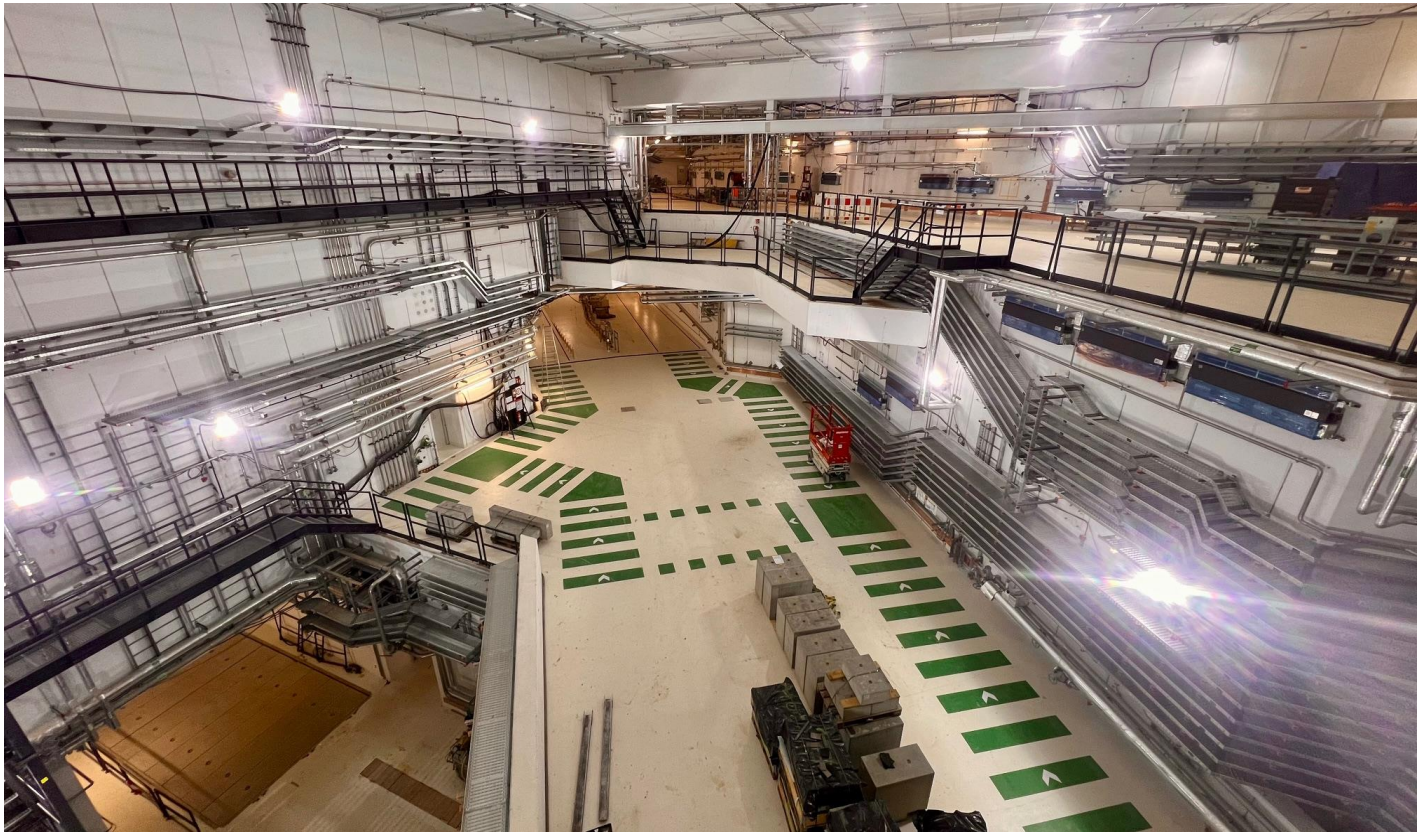
## - Construction site view



# FAIR Project Progress – Civil Construction

View of north area (SIS100) with all buildings completed

# FAIR Project Progress – Civil Construction
## - Central Transfer building

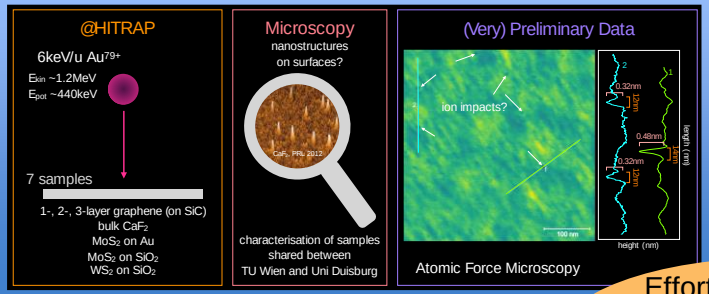


# FAIR Project Progress – Accelerator
## - Accelerator Installation - SIS100

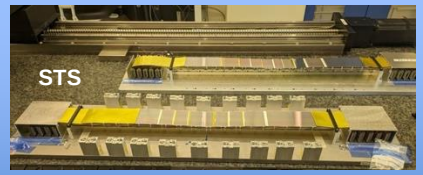
# Experimental Progress

## APPA

### 1st User Experiment at HITRAP




## CBM



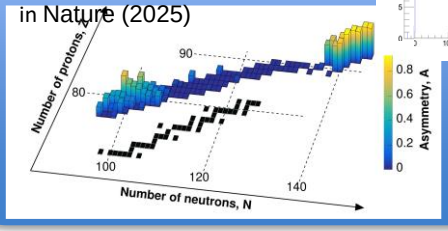

**Series production**
- STS modules/ladders
- TOF MRPC counters
- RICH cameras

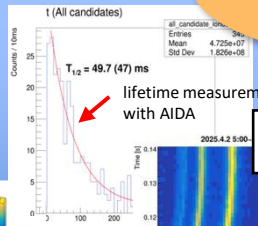


Effort to best use the part of FAIR which will be available by 2028

## NUSTAR

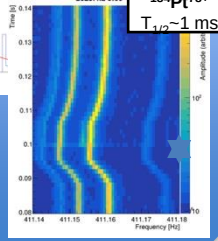
fission measurement, published in Nature (2025)




lifetime measurement with AIDA

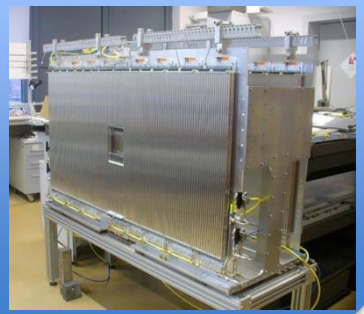
Isomer in $^{184}Pt^{78+}$
$T_{1/2}$~1 ms



## PANDA

EMC Backw. Endcap at MAMI

Forward Tracker at JU Krakow

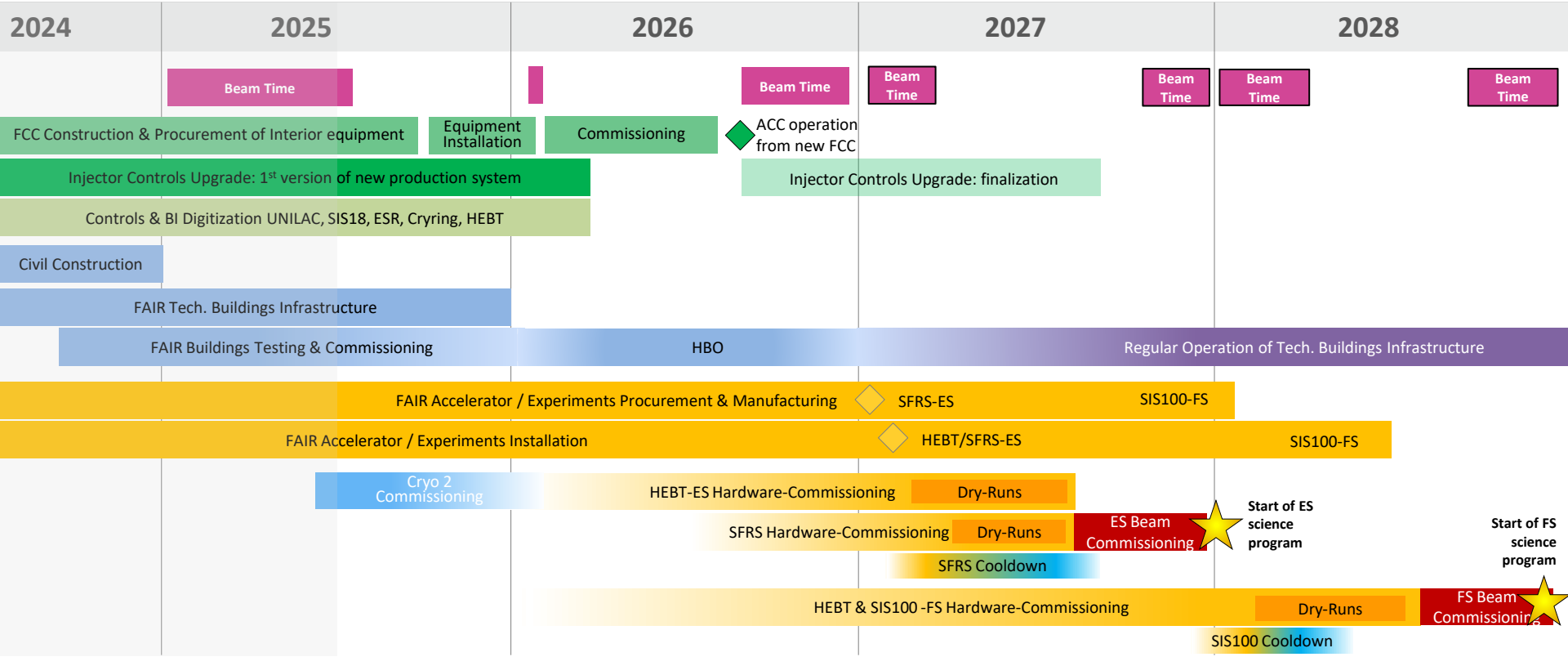



45. CBM Collaboration Meeting
GSI, Darmstadt 16-21 February 2025
Compressed Baryonic Matter
HADES
FAIR
GSI
1: Time-Zero Detector & Beam Diagnostics
2: Silicon Tracking System / Micro Vertex Detector
3: Superconducting Dipole Magnet
4: Muon Chambers
5: Ring Imaging Cherenkov Detector
6: Transition Radiation Detector
7: Time of Flight Detector
8: Forward Spectator Detector

# CBM final setup including HADES

# PANDA@MSV visualization

# FAIR & GSI Integrated Schedule




Version Q2 2025


Thank you for your attention, wishing you a productive workshop!