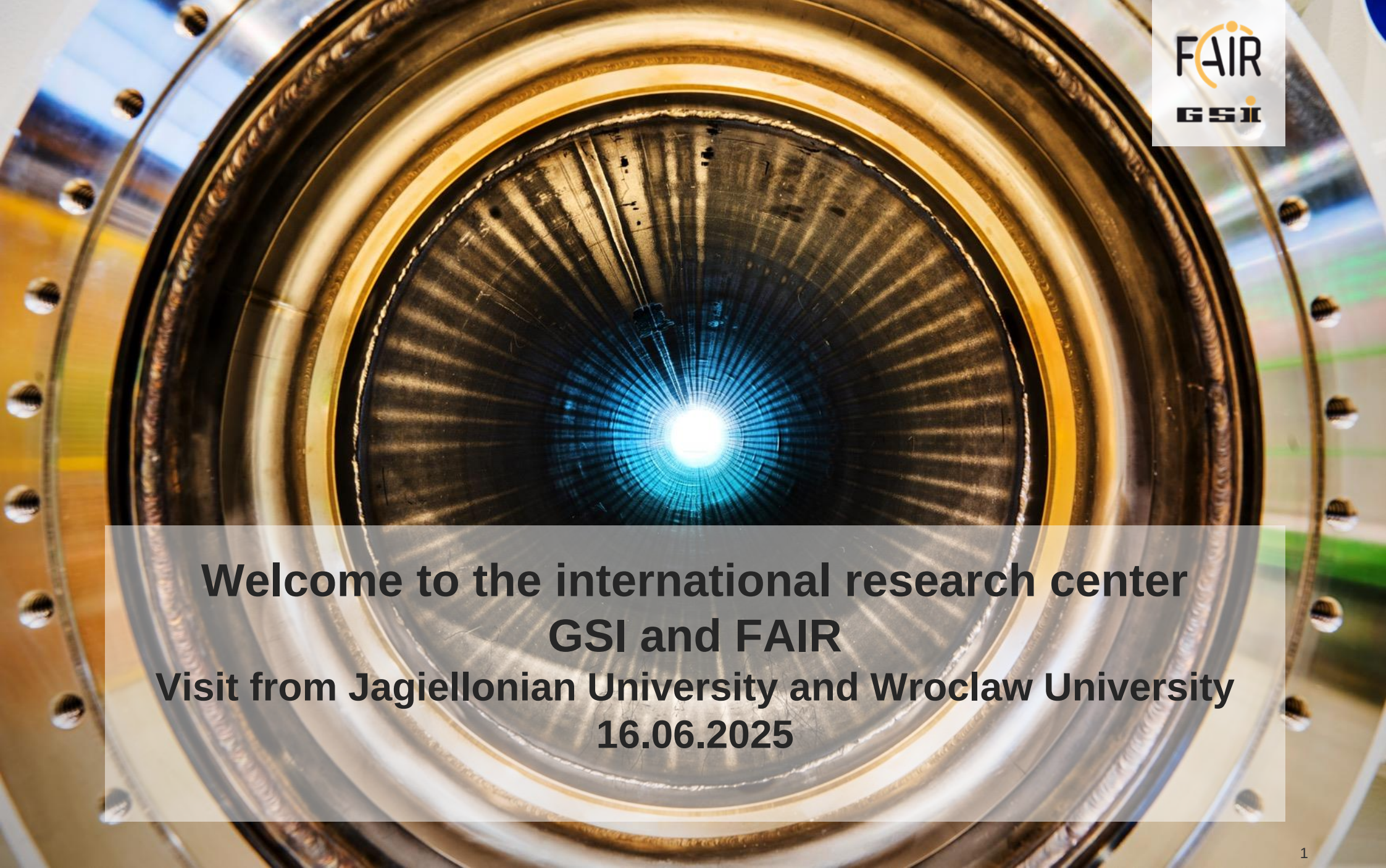


A close-up, circular view into the interior of a particle accelerator. The central part is a bright blue light source, with numerous thin, dark, radial lines extending outwards, creating a sunburst effect. The surrounding structure is made of polished metal with visible rivets and welds.

**Welcome to the international research center
GSI and FAIR**
Visit from Jagiellonian University and Wroclaw University
16.06.2025

Management Board GSI and FAIR



Prof. Dr. Thomas Nilsson, Scientific
Managing Director GSI and FAIR



Dr. Katharina Stummeyer, Administrative
Managing Director GSI and FAIR



Jörg Blaurock, Technical Managing
Director GSI and FAIR

Integrated Organization Chart GSI & FAIR

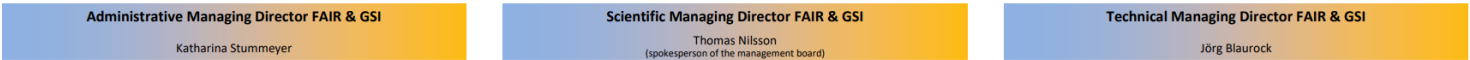


FAIR GmbH & GSI GmbH

Supervisory boards



Management board



Business area



Business area



External committees



Internal committees



Delegated functions

(direct report to management board)

- Data protection officer
- Export control officer
- Internal audit & compliance
- Radiation protection commissioner
- Senior Safety Engineer

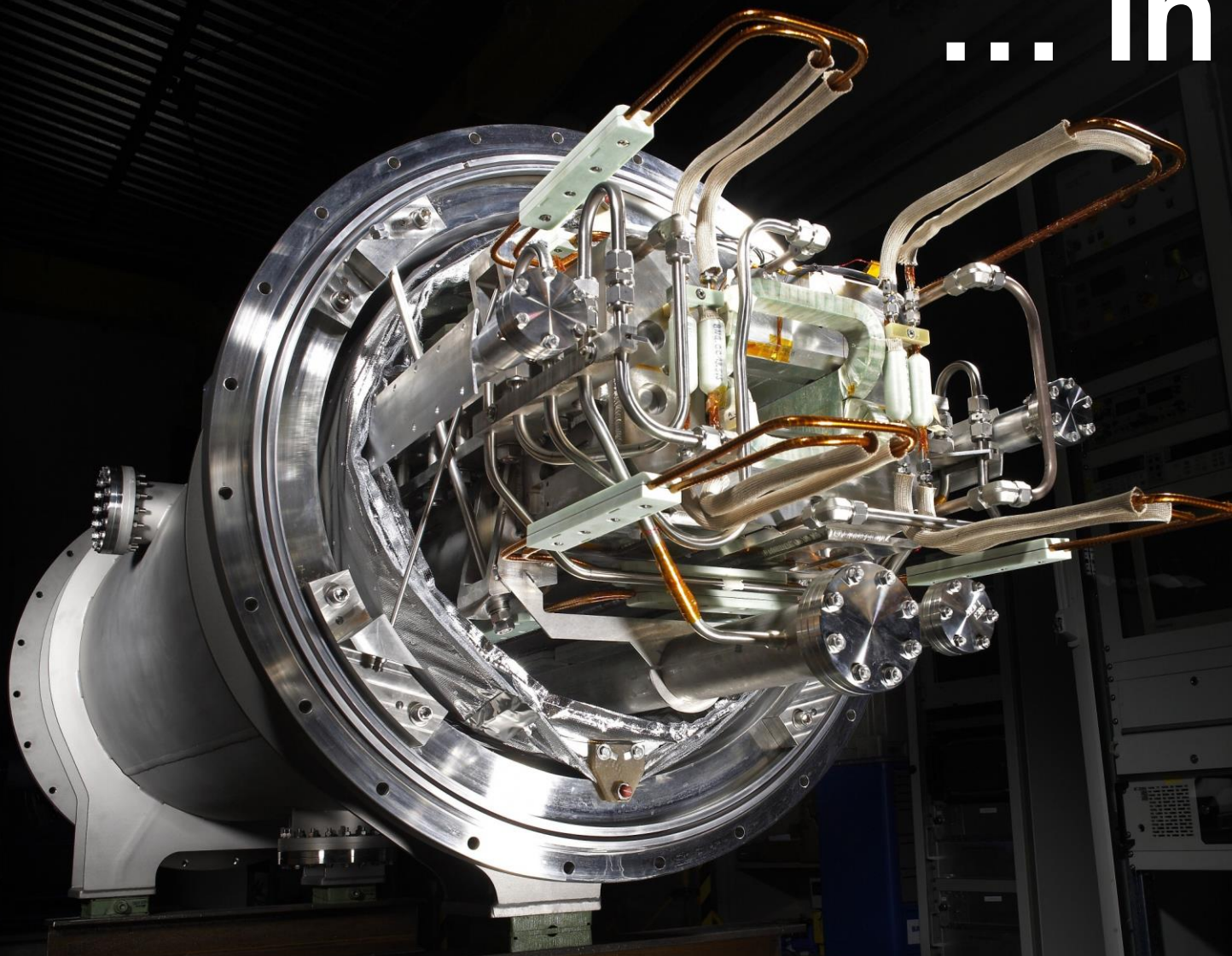
Legend:





**We explore
the universe...**

... in the lab.



**Our objective:
Creating extreme
conditions existing in
the universe with
heavy ion accelerators**

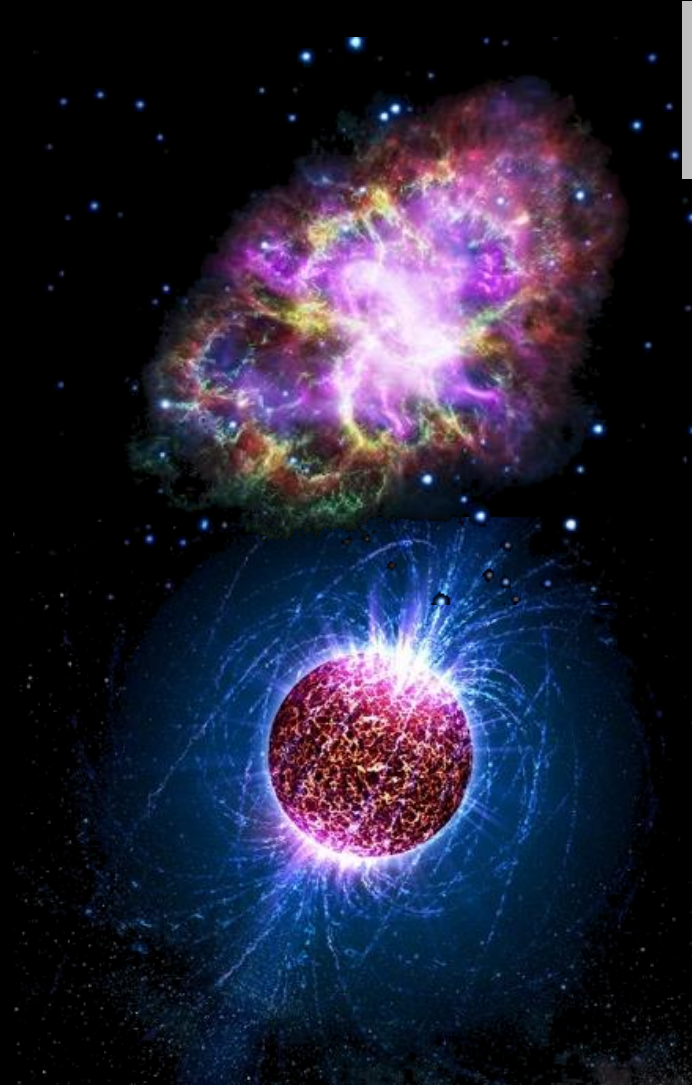


Foto: NASA, ESA, G. Dubner (IAFE, CONICET-University of Buenos Aires) et al.; A. Loll et al.; T. Tenim et al.; F. Seward et al.; VLASRAO/AU/INSF; Chandra/CXC; Spitzer/JPL-Caltech; XMM-Newton/ESA; and Hubble/STScI (oben), Penn State University (unten)

**To find answers to fundamental questions about the Universe:
The Universe in the lab ...**

4 research pillars

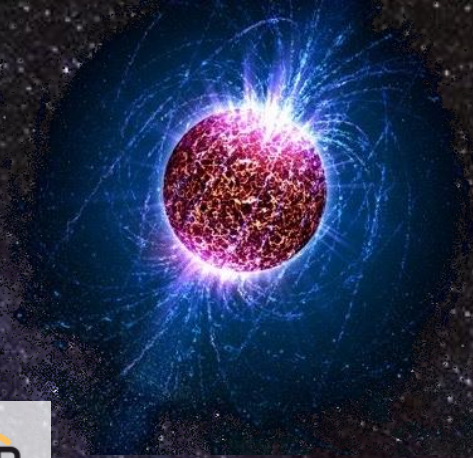
Where are heavy
elements created?

NUSTAR



What is in the interior of a
neutron star?

CBM



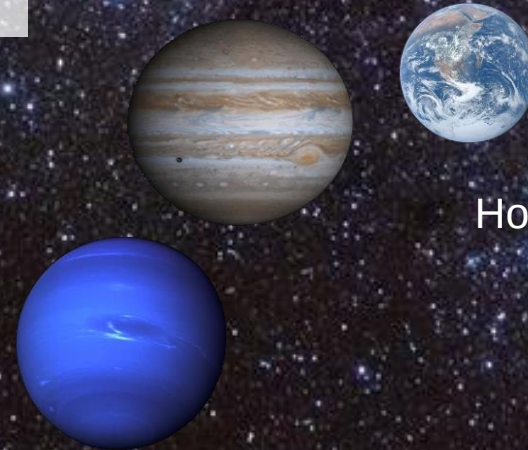
PANDA

Glueballs:
What are protons and
neutrons made of?
What is the structure of hadrons?



APPA

How do materials behave
under high pressure?



Fotos: Uranus, Jupiter, Erde Quelle: <http://de.wikipedia.org>

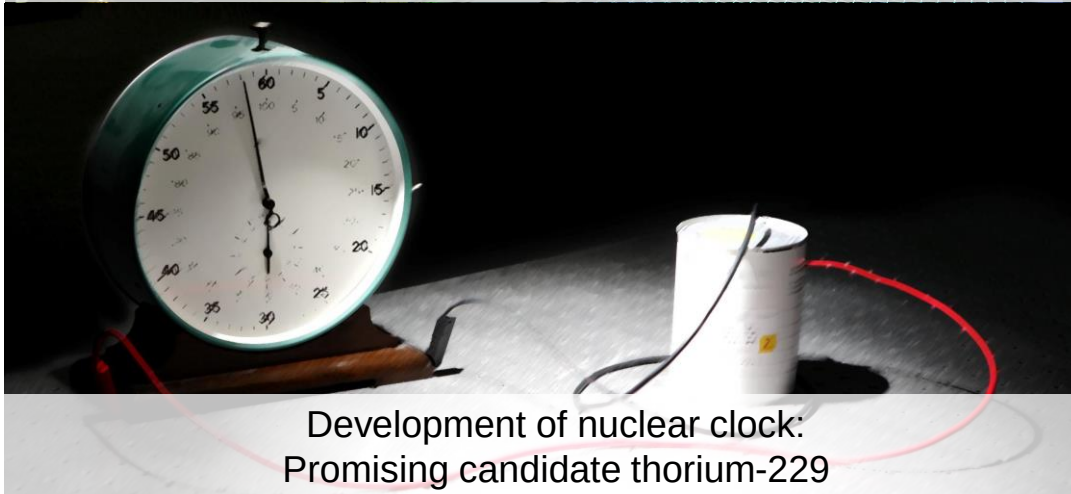
... with direct applications



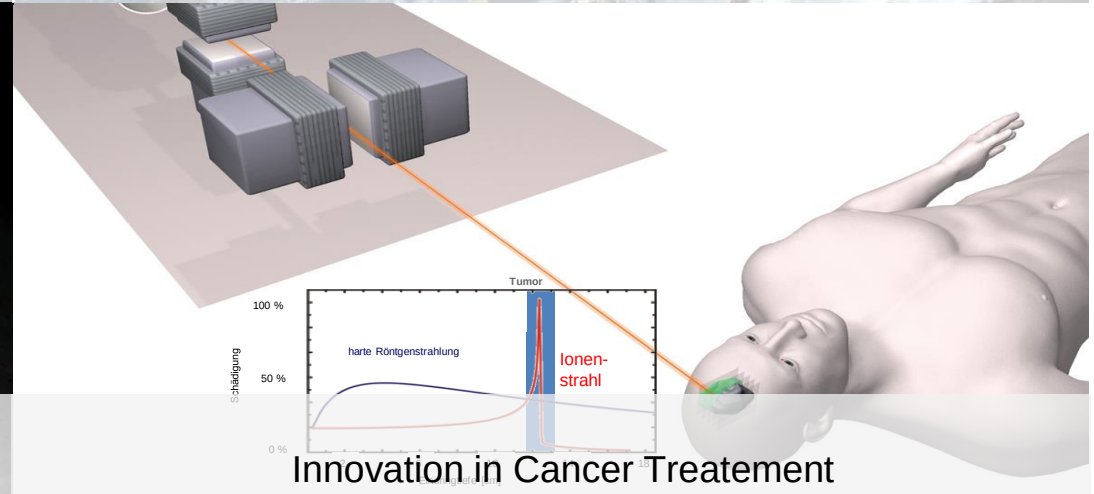
High-performance and scientific computing, big data, green IT



Space radiation protection, unique facility for simulation, collaboration with ESA



Development of nuclear clock:
Promising candidate thorium-229

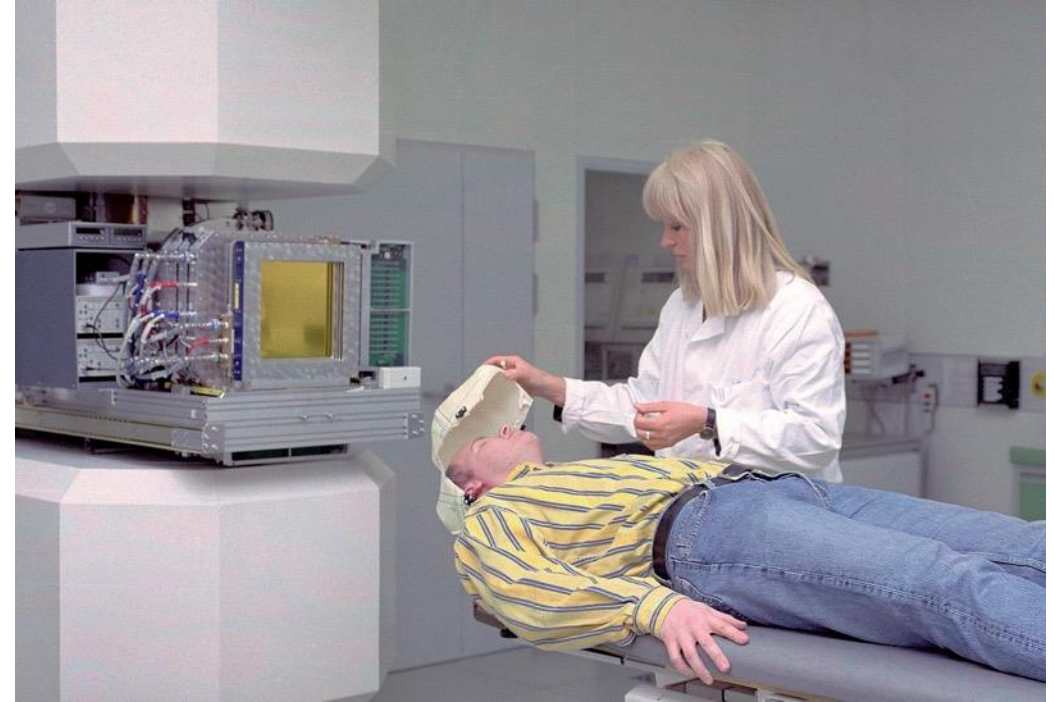


Innovation in Cancer Treatment

GSI: A research center with history ...

The image shows a periodic table of elements. A callout box highlights the elements Bh (Bohrium, 107), Hs (Hassium, 108), Mt (Meitnerium, 109), Ds (Darmstadtium, 110), Rg (Roentgenium, 111), and Cn (Copernicium, 112). These elements are labeled as 'bei GSI entdeckt' (discovered at GSI). The legend indicates: green for 'natürlich' (natural), yellow for 'experimentell erzeugt' (experimentally produced), and orange for 'bei GSI entdeckt' (discovered at GSI).

1	2																	18												
H	He																	He												
Li	Be																	B	C	N	O	F	Ne							
Na	Mg																	Al	Si	P	S	Cl	Ar							
K	Ca	Sc											Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr			
Rb	Sr	Y											Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe			
Cs	Ba	La	58-71										Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn			
Fr	Ra	Ac	90-91										Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	N	Fl	Mc	Lv	Ts	Og			
																		Os	Ir	Pt	Au	Hg								
																		Bh	Hs	Mt	Ds	Rg	Cn	N						
																		Bohrium	Hassium	Meitnerium	Darmstadtium	Roentgenium	Copernicium							



Discovery of new elements:

- In total, six new chemical elements added to the periodic table
- Investigation of the physical and chemical properties of superheavy elements

Tumor therapy with carbon ions:

- Precise, gentle and successful: more than 90% cure rate
- Treatment of 440 patients at GSI
- Transfer to clinical application, several 1000 people treated in Marburg and Heidelberg
- At GSI: Research and further development



- Green IT & Big Data:
Technological progress through sustainable, energy-efficient high-performance IT for scientific computing
- AI innovation lab of the Hessian Center for Artificial Intelligence (hessian.AI) for start-ups and SMEs, amongst others

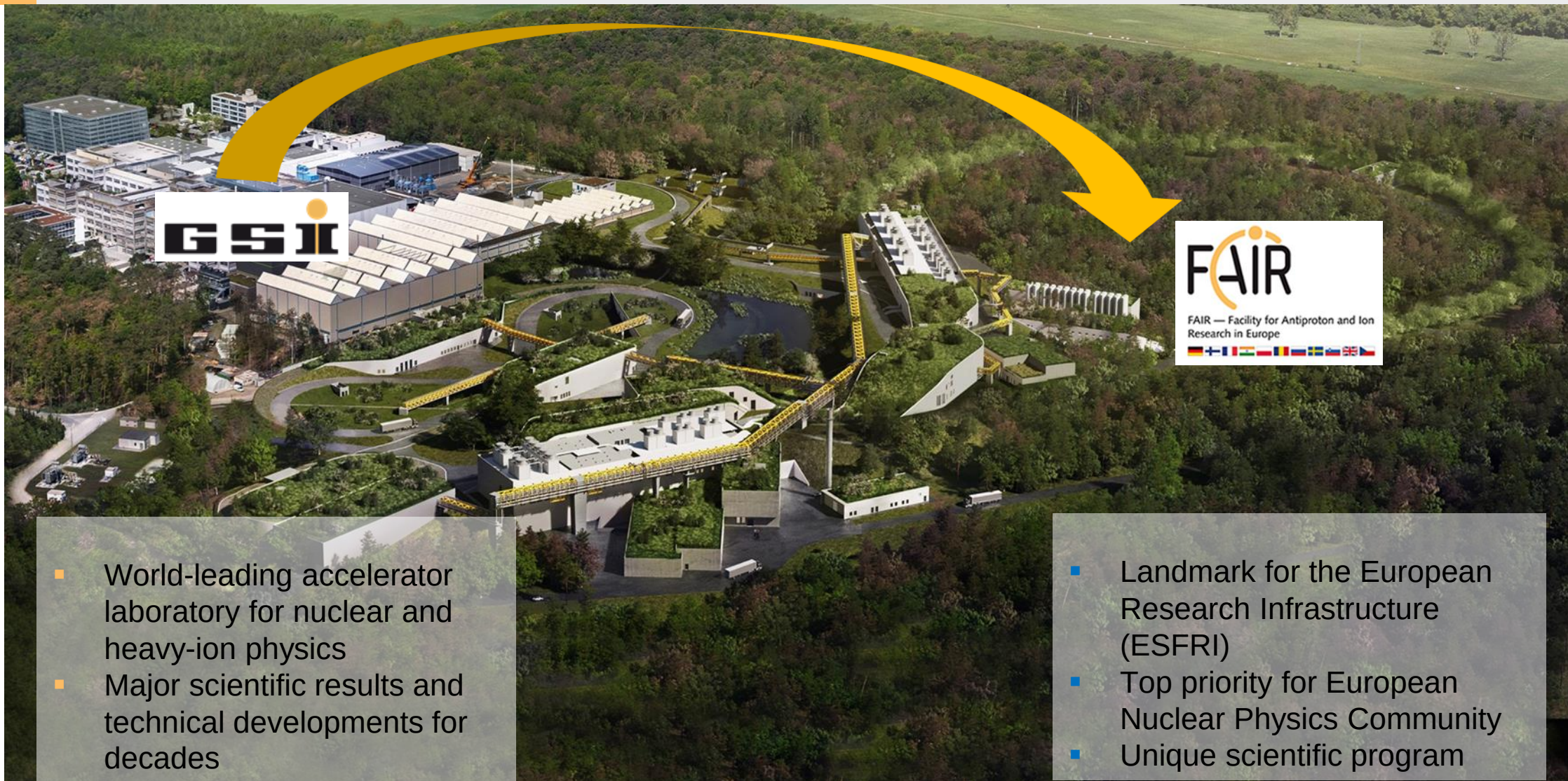
A Talent Factory



- **World-leading heavy-ion laboratory as a center for scientific and technological excellence in Germany / Europe.**
- **Science**
World-renowned research within the framework of international collaborations. Cutting-edge research in physics and astrophysics with key contributions and new findings in biology, chemistry and medicine.
- **Technology**
News and innovative applications to solve urgent questions from society in health, materials and cutting-edge technologies such as IT and space travel.
- **Economy**
Training top talent for science and technology to secure Germany's long-term competitiveness
- **Highly qualified top employees and talents**
Attracting and developing talent and expertise. Working closely with universities to raise the next generation of talent in science and technology, through **GET_INvolved Programme**.

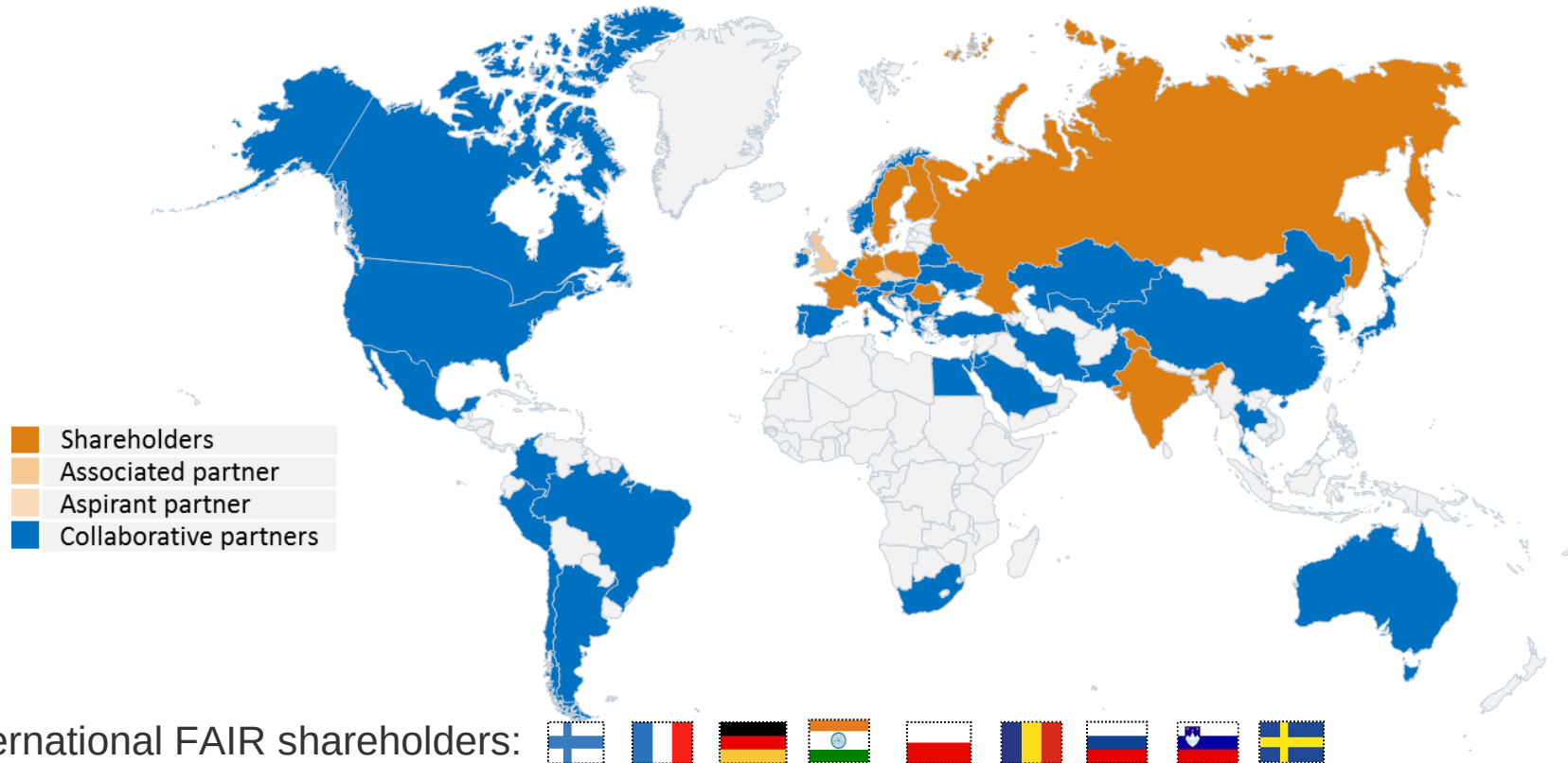


GSI and FAIR – a Talent factory



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

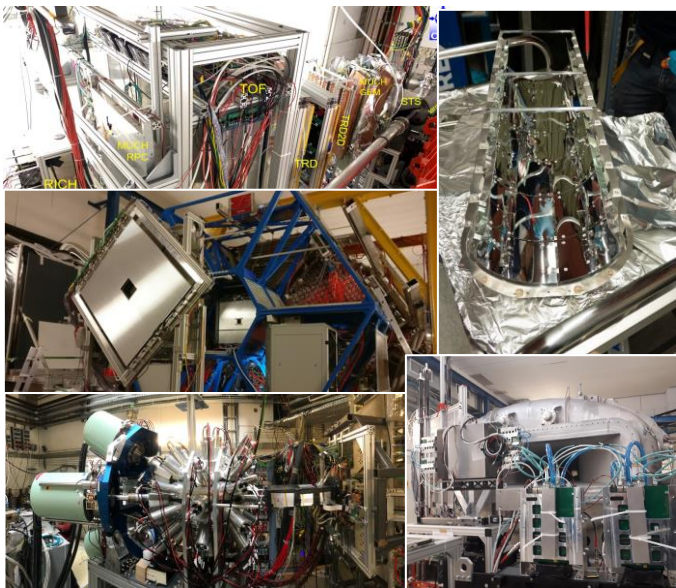
- Landmark for the European Research Infrastructure (ESFRI)
- Top priority for European Nuclear Physics Community
- Unique scientific program



- 9 international FAIR shareholders:         
- + 1 associated partner: 
- + 1 aspirant partner: 
- Over 3000 Scientists and Engineers from all over the world
- More than 200 institutions from 53 countries are involved with their scientists

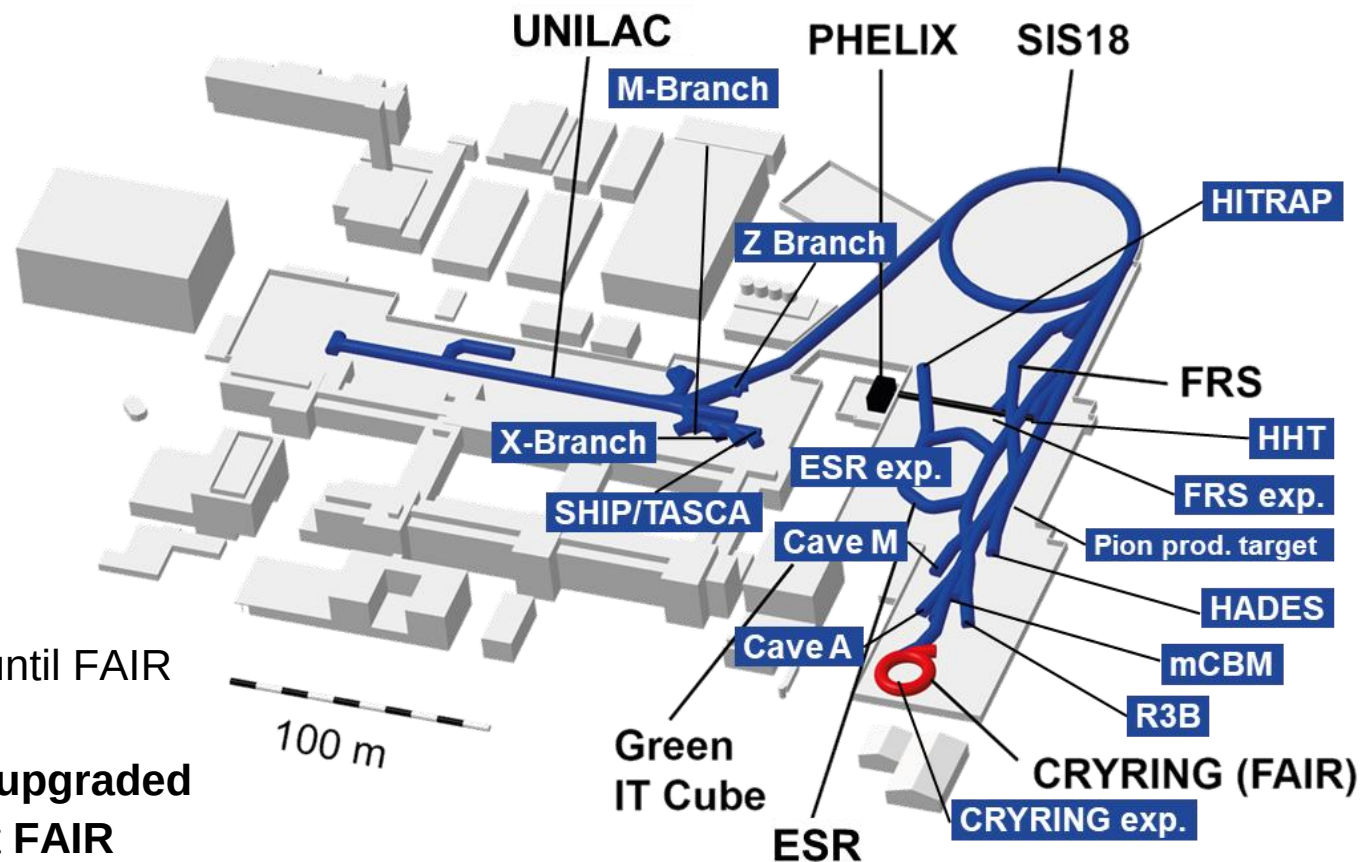
Towards FAIR

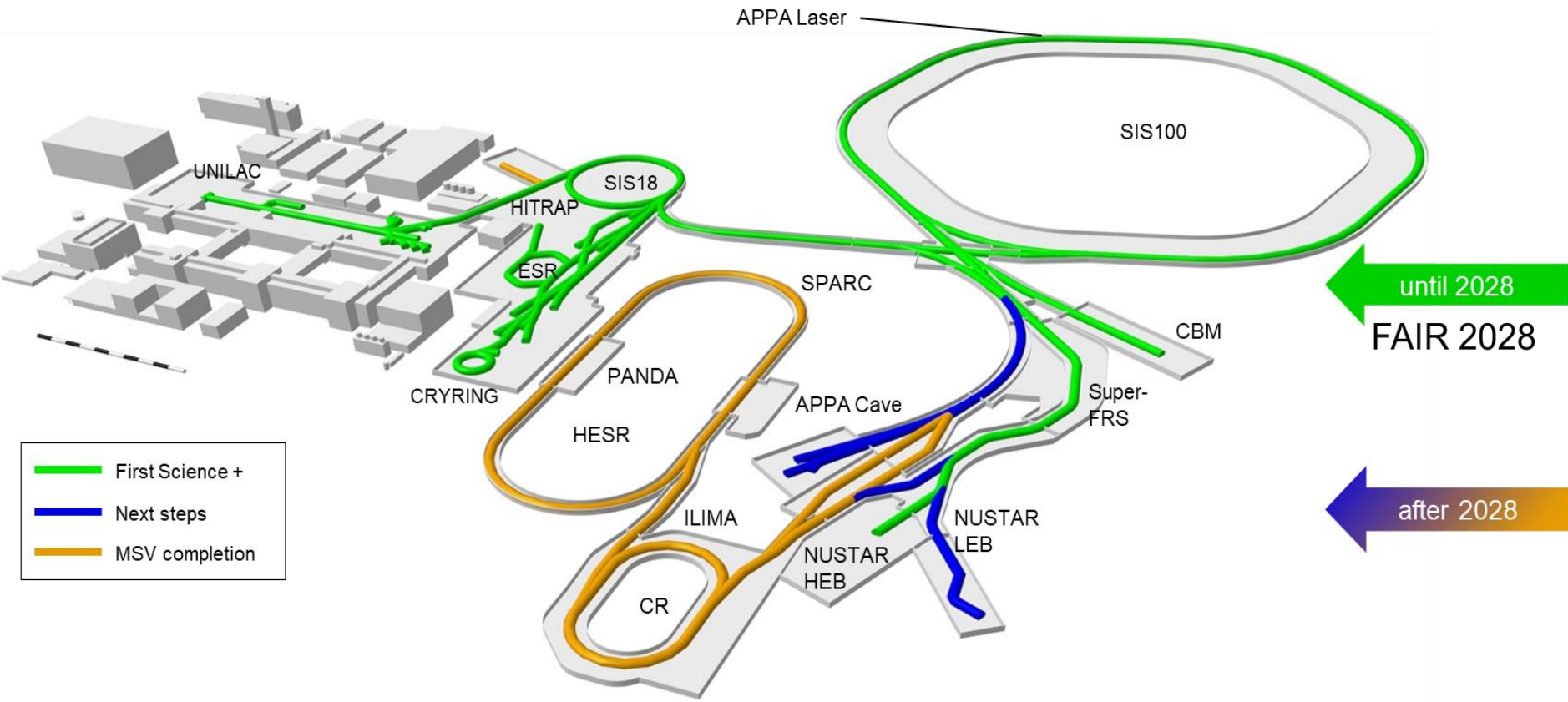
FAIR Phase-0 - Stepwise Approach to FAIR Science



FAIR Phase-0 started in 2019

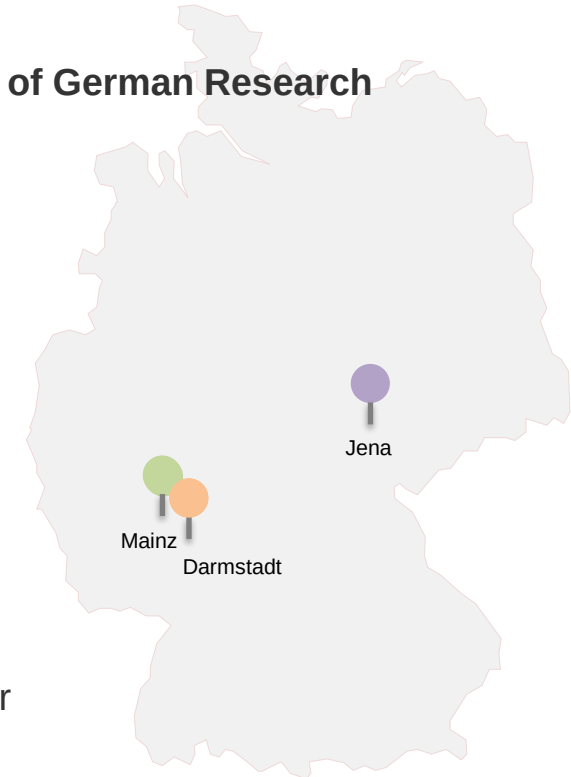
- 100 days of beam time per year until FAIR starts operation
- Commissioning and operation of **upgraded GSI accelerators** and newly built **FAIR detectors**







- **Member of the Helmholtz Association of German Research Centres (HGF)**
- **Founded:** 1969
- **Shareholders:**
 - Federal Government (90%)
 - State of Hesse (8%)
 - State of Rhineland-Palatinate (1%)
 - State of Thuringia (1%)
- **Annual Budget:** 221.2 M€
- **Employees:** approx. 1,500
- **Guest Scientists:** around 1,000 per year



Helmholtz-Institut Mainz (HIM)

- Founded: 2009
- Affiliated to Johannes Gutenberg University Mainz
- Budget: approx. 7 M€
- Employees: approx. 92
- Students: approx. 25

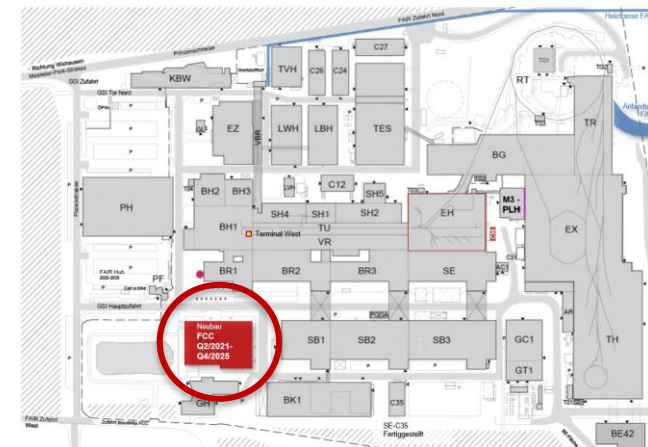
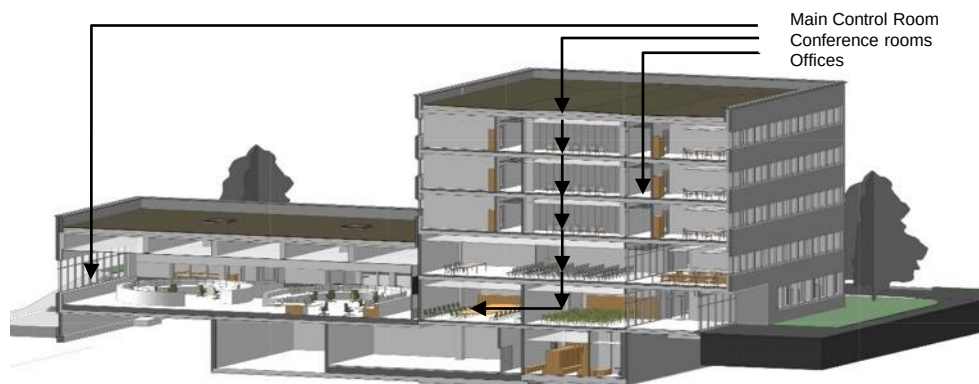


Helmholtz-Institut Jena (HIJ)

- Founded: 2009
- Affiliated to Friedrich Schiller University Jena
- Budget: approx. 8.5 M€
- Employees: approx. 75
- Students: approx. 56



Campus development – FAIR Control Center FCC



- Main control room GSI and FAIR accelerators
- 5 levels
- 206 office workspaces
- Conference rooms
- Completion mid 2026



Basic Science to Application: Technology Transfer



Collaborative R&D Opportunities

Partner with experts on innovative research and technology development.



Technology Licensing & Transfer

Access innovative technologies and expert know-how.



Unique Technologies, Infrastructures & Products

Explore research-driven innovations for your industry.



Contract Research & Consultancy

Utilise specialised expertise and facilities for tailored solutions.

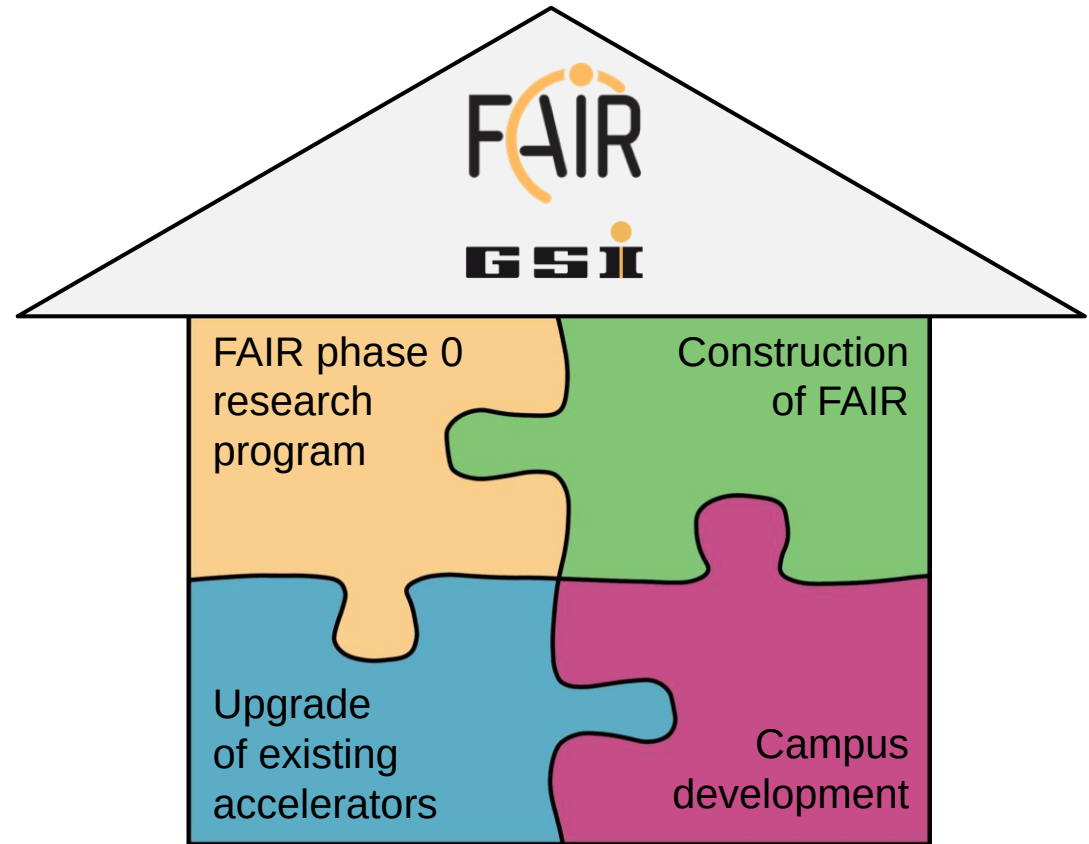
Contact us: transfer@gsi.de

Follow us on
LinkedIn

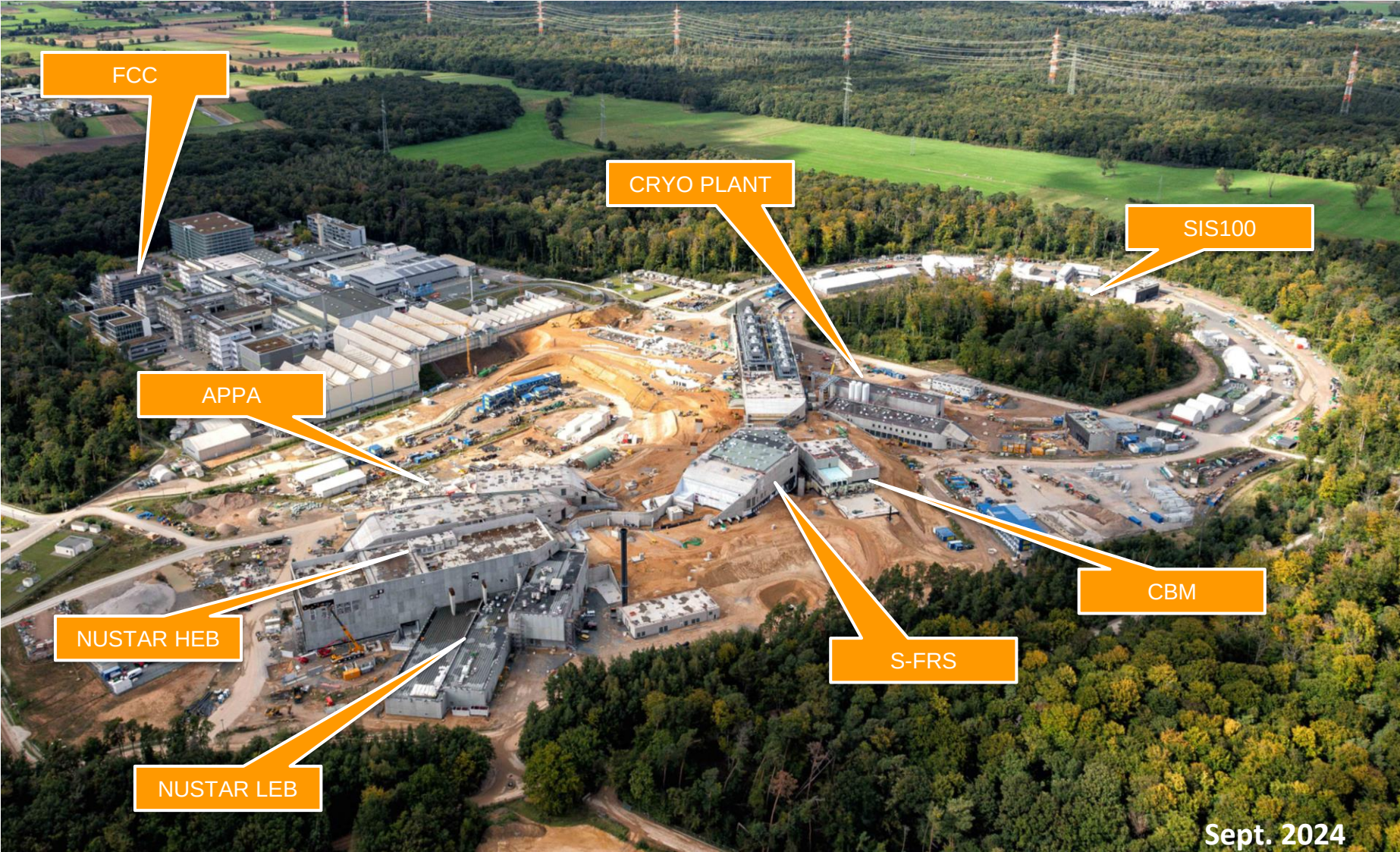


Four strategic objectives

- **Construction of FAIR**
- **FAIR phase 0 research program**
- **Upgrade of existing accelerators**
- **Campus development**



FAIR Construction Site



View of north area (SIS100) with all buildings completed



View of south area with all buildings completed and soil modelling started



FAIR Project Progress – Civil Construction

- Central Transfer building



FAIR Project Progress – Accelerator

- Site Management



Super-FRS Branch Box



Cryo 2 ready for Commissioning



SIS100 Straight 4
Cabling by ELC completed
installations



HE- Tanks – Filled with Helium
for Cryo Commissioning



Shielding Flask in Target
section Super FRS



SIS100 Arc 3&2 Dipoles
First Phase Mechanical Installation
completed

FAIR Project Progress – Accelerator

- Accelerator Installation - SFRS



Installation of lateral shielding blocks completed in the Super-FRS target area, SFRS flask delivered



First S.C. Multiplet in SFRS pre target area



FAIR Project Progress – Accelerator

- Accelerator Installation - SIS100



FAIR facility – Worldwide procurement of components for the accelerator and experiments



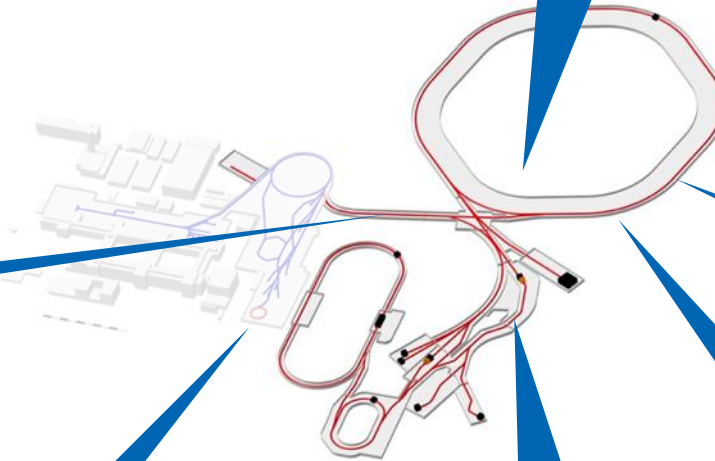
Power Converters for
the entire facility



SIS100: Quadrupol-Magnet



HEBT: Dipol-Magnete



SIS100: Vacuum chambers



CARME Spektrometer in CRYRING



SFRS: Multipllett-Magnet in teststand@CERN



SIS100: Dipolmagnet

FAIR Project Progress – Accelerator

- Production and delivery of main components in full swing



SIS100:
electrostatic
septum at
supplier
workshop



SIS100:
Cryo bypass line
end box
positioned in
SIS100 tunnel



Super-FRS:
Branch Box for
Cryogenic
Distribution



HEBT:
Production of
normal-
conducting
magnets in
progress



FAIR Project Progress – Accelerator

- Warehouse Weiterstadt nearby to FAIR site



FAIR Project Progress – Accelerator

- Production and delivery of main components in full swing



- Assembly work on the Linde Cryo system has been completed. Commissioning will begin mid 2025



- 6 helium tanks installed for the cryogenic system



FAIR Project Progress – Experiments

- CBM cave



CBM cave with experiment platform and magnet foundation
ready for next installation steps



CBM Collaboration Meeting, held from
February 16 – 21, 2025

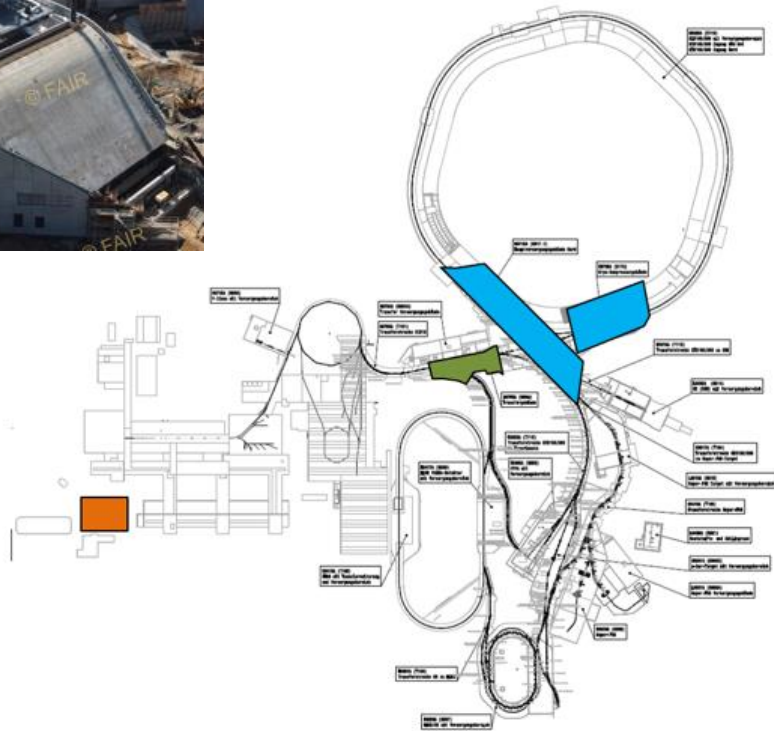


CBM experiment in the future



FAIR Project Progress – Commissioning

Start of Commissioning in 2025



Q3/2025:
Start of
commissioning of
Cryo plant and
Cooling water system

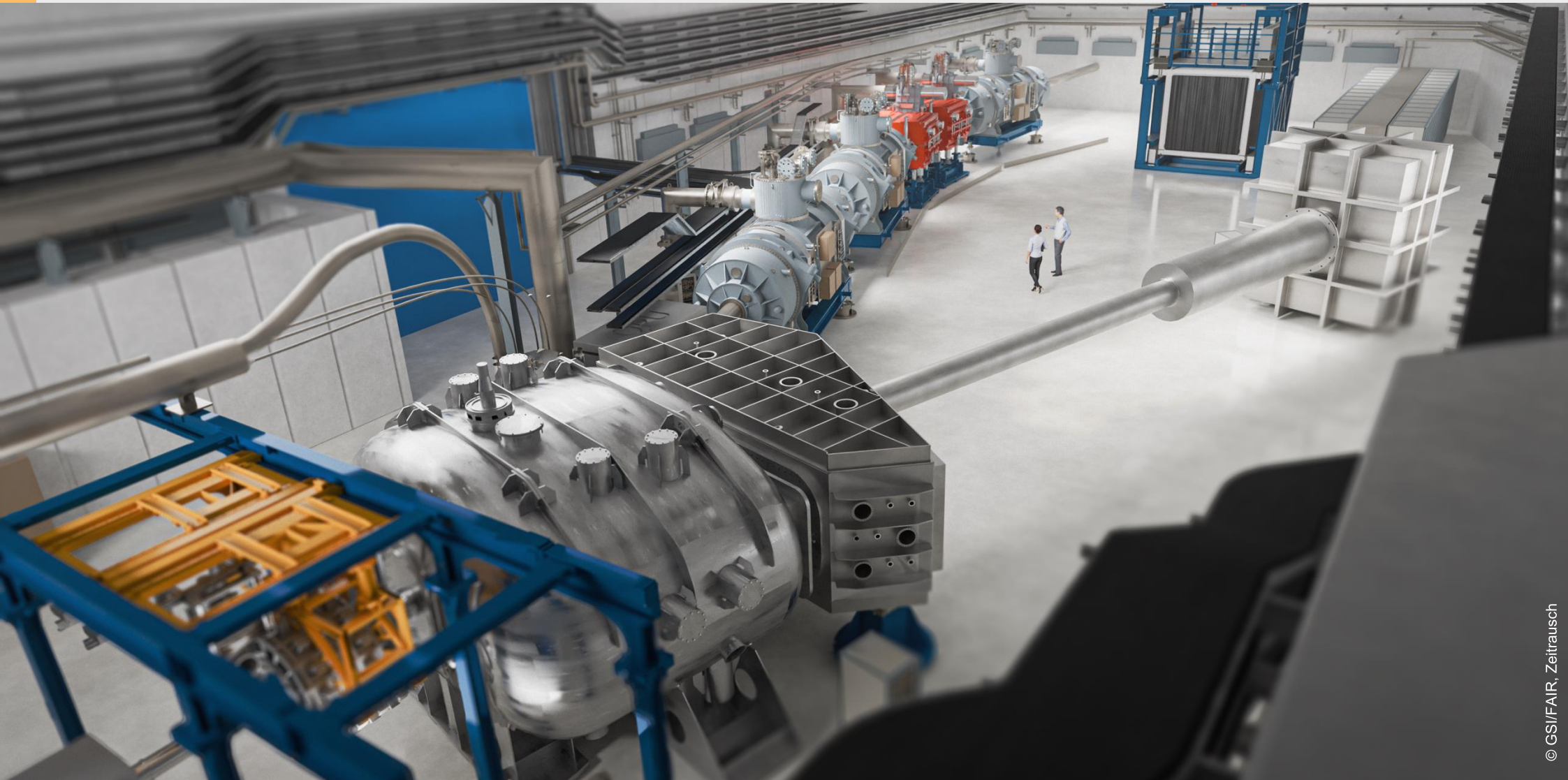
Q4/2025:
Initial steps for HEBT
commissioning

Q4/2025:
Takeover of main
control room in FAIR
Control Center (FCC)

View to the future : SIS100



View to the future: NUSTAR





Thank you for your attention!