



The FAIR Project

Realization of the world's unique particle accelerator facility in Darmstadt

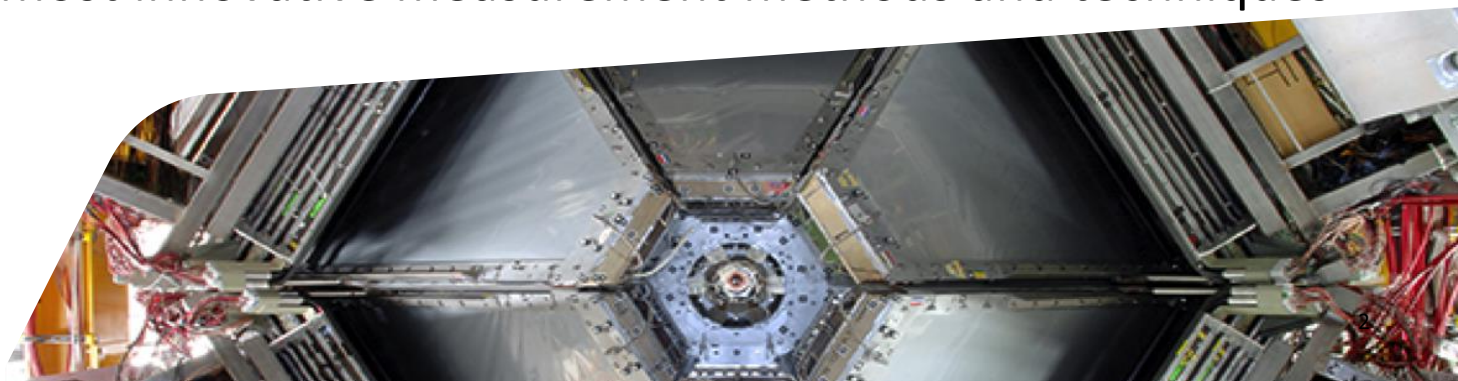
Jörg Blaurock

Technical Managing Director FAIR GmbH & GSI GmbH



FAIR – Facility for Antiproton and Ion Research

- Unique particle accelerator facility for research with antiprotons and ions worldwide
- Matter as it occurs in the universe is first produced and researched in the laboratory
- Fundamental research and development of applications in materials research, radiation biology, aerospace, etc.
- Collaboration between several teams of top international researchers - more than 3,000 scientists
- Different research programs in parallel with different ion varieties possible
- FAIR develops and uses the most innovative measurement methods and techniques



Overview of Shareholders & Scientific users located worldwide



Shareholders

Germany
Finland
France
India
Poland
Romania
Russia
Sweden
Slovenia

Associated

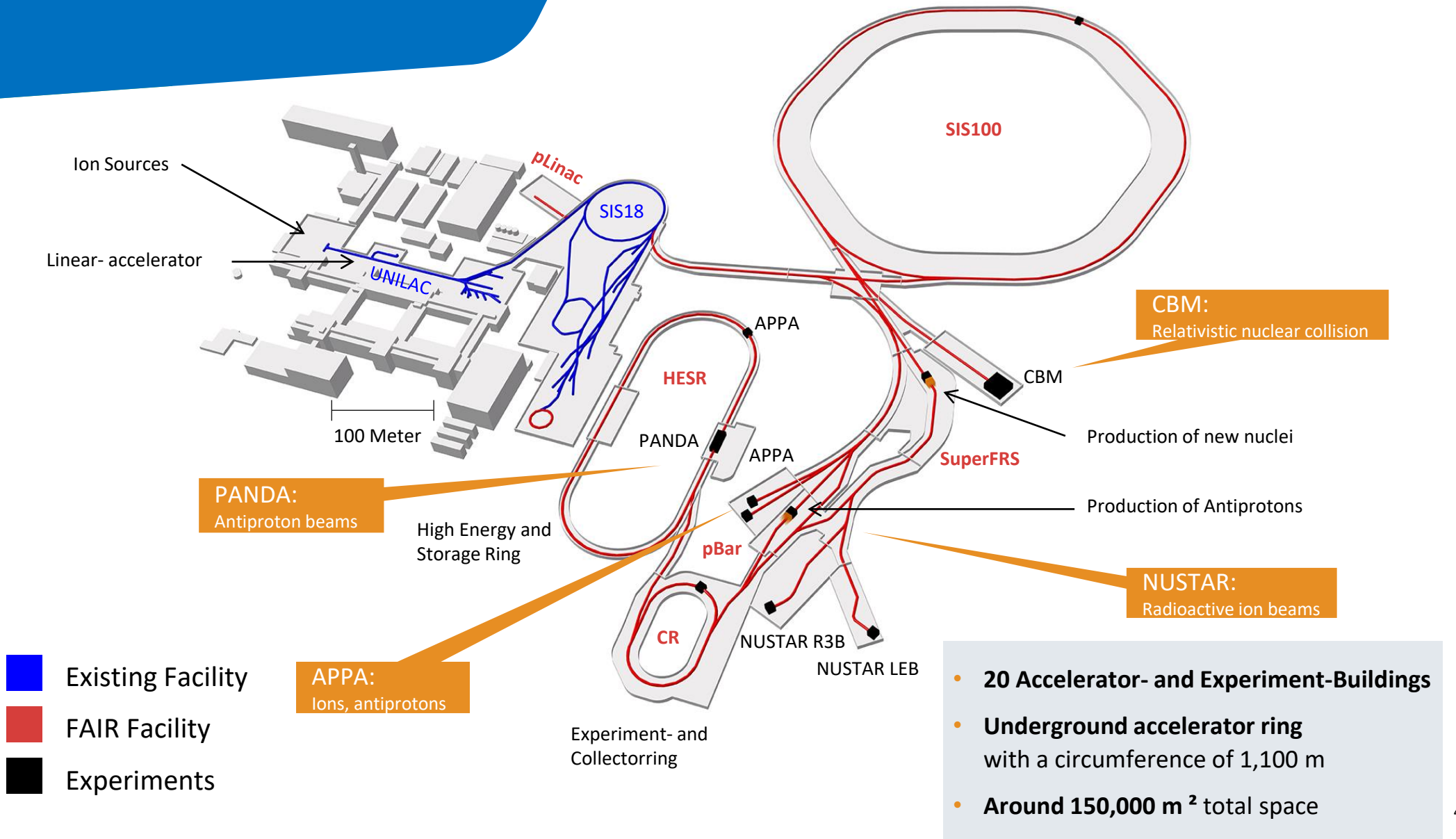
Great Britain

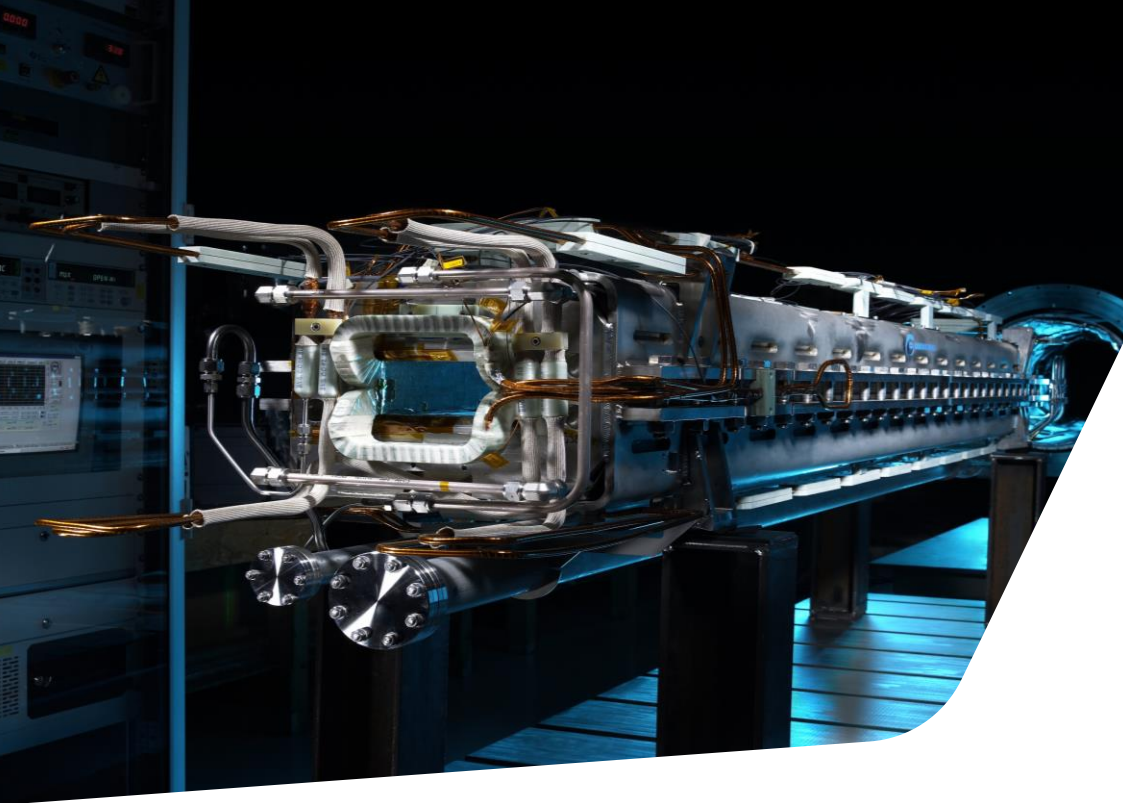
Aspirant

Czech Republic

Cooperation of about 400 institutes in more than 50 countries
1,580 employees on Campus FAIR / GSI in Darmstadt (Germany)

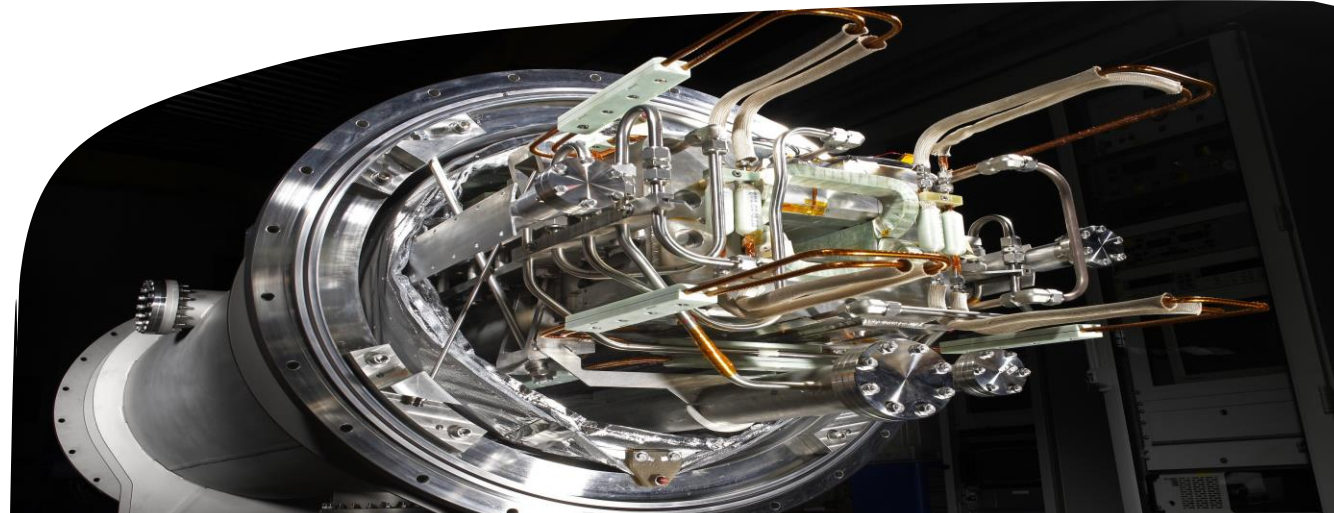
FAIR – The Facility





- **Superconducting magnets:** For high and fast-changeable magnetic fields with the highest field accuracy
- **Cryotechnical technology:** Cooling by liquid helium at 4 Kelvin (-269°C)
- **Ultra-high vacuum:** 10^{15} times lower than air pressure
- **Development and construction** of cryo-column limates with special coating

Overview of the used technology



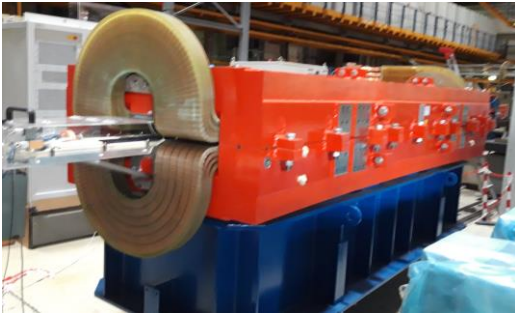
FAIR facility - worldwide production and delivery of accelerator components and experiments



p-Linac: RFQ- Development



HESR: Quadrupol-Magnets



HESR: Dipole-Magnet



CR: Dipole-Magnet



HEBT: Dipole-Magnets



Power
Converters



SIS100: Quadrupol-Magnet



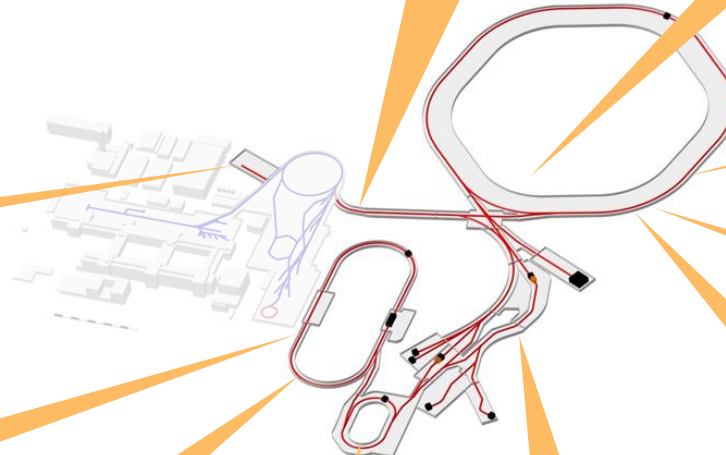
SIS100: Vacuum Chambers



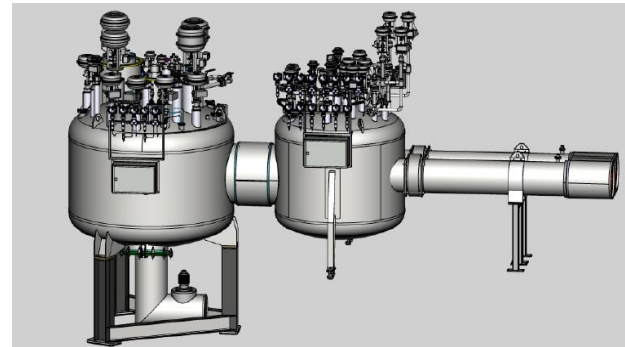
SIS100: Dipole-Magnet



SFRS: Multiplet-Magnet CERN test facility



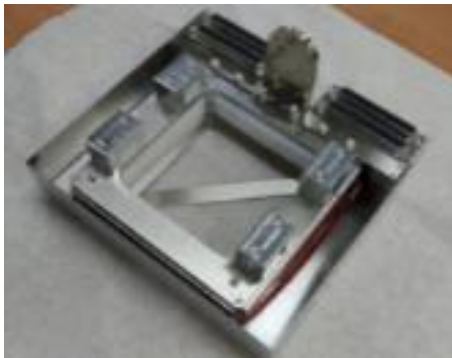
Contribution by Poland to FAIR



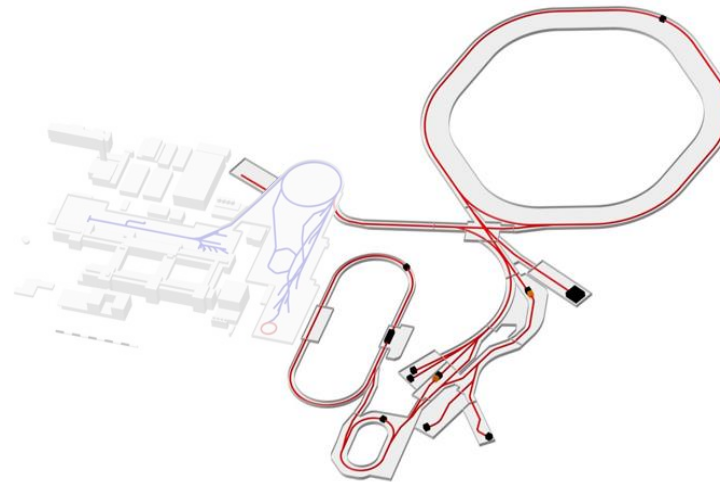
SIS100: Feed Boxes by University WUST



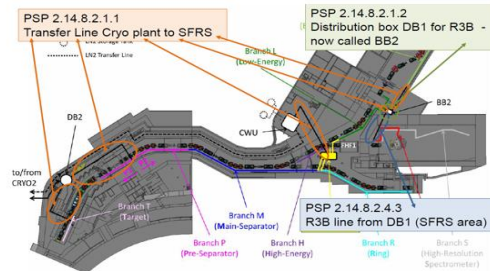
SFRS: Local Cryogenic by University WUST



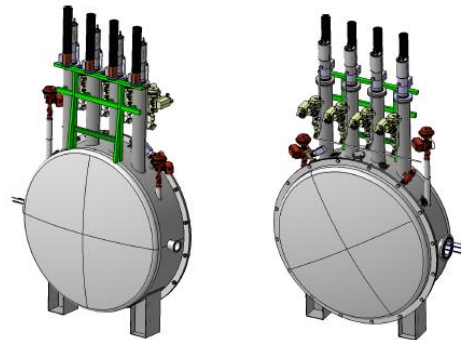
HEBT: SEM Grid detector by company PREVAC



1.1 Scope



HEBT: Cryo transfer line by University WUST



SFRS: Current Lead Boxes by University WUST



SIS100: Cryo Bypass Lines by company Kriosystem



SIS100: Magnet test system by company GUT



Construction Dimensions

2 Mio. m³

Ground

will be moved

600.000 m³

Concrete

will be installed

65.000 t

Steel

will be deployed

Status as of Oct. 2021 : more than 50 % executed

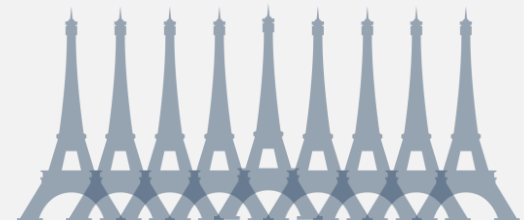
Correspond to 5,000 single-family houses



Correspond to 8-times the football stadium of Frankfurt



Correspond to 9 Eiffel Towers



FAIR in construction



FAIR in construction



FAIR in construction



FAIR in construction



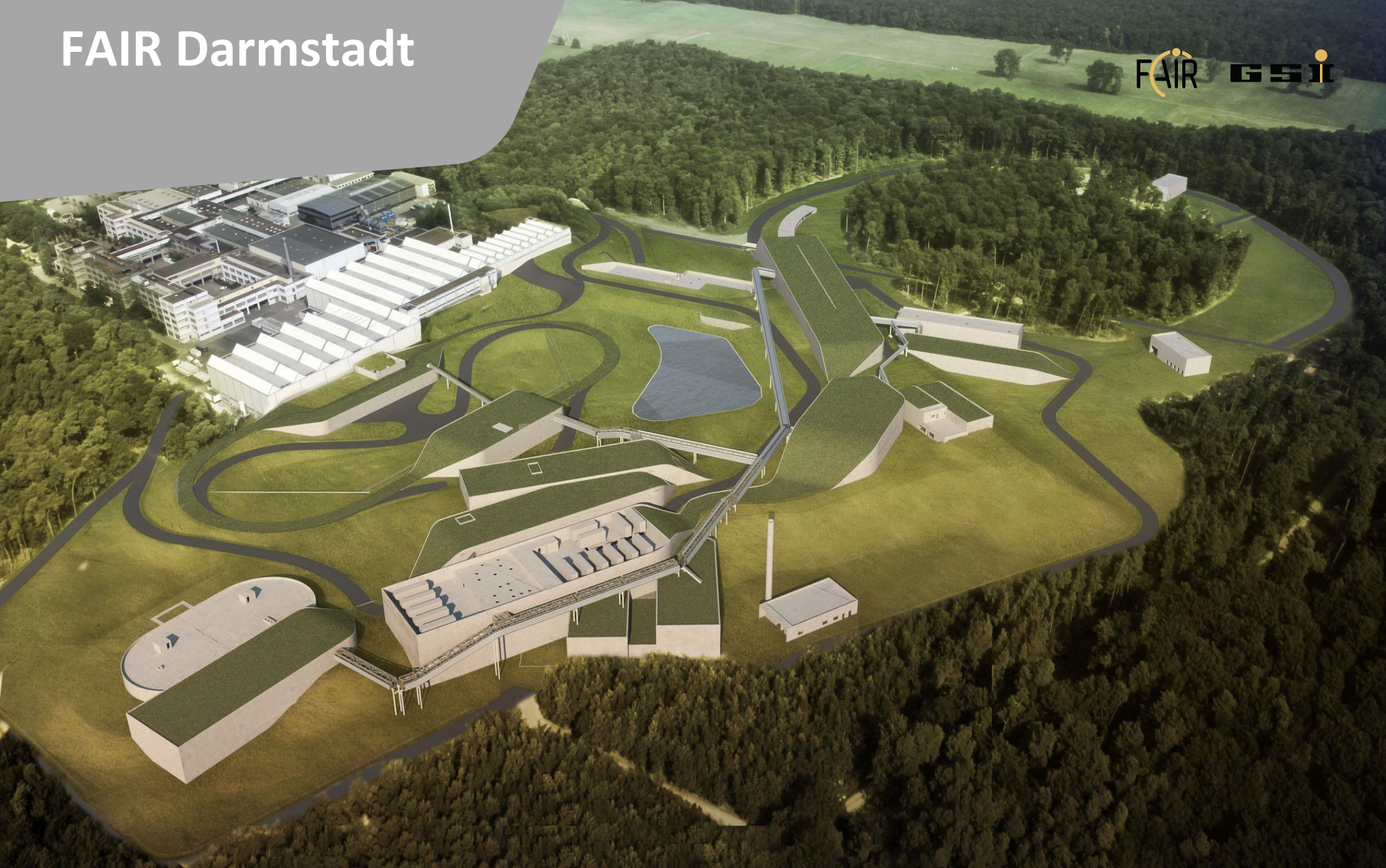
FAIR in construction



FAIR in construction



FAIR Darmstadt





FAIR – the Univers in the Lab



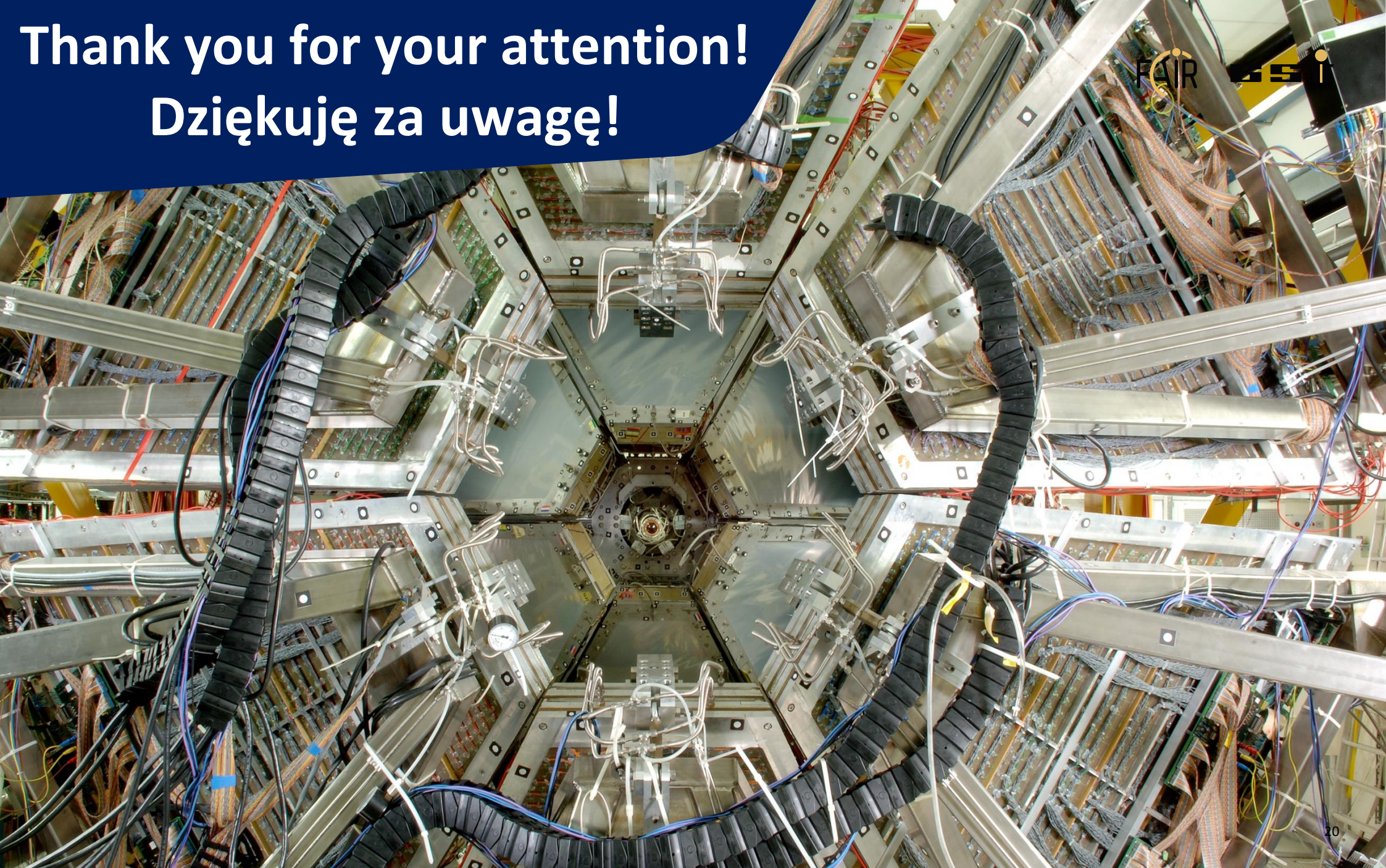
FAIR – An important research location in Europe and worldwide



FAIR – Architecture in balance with nature



FAIR – high technology in research



Thank you for your attention!
Dziękuję za uwagę!