

FAIR – FACILITY FOR
ANTIPROTON & ION RESEARCH:
*THE UNIVERSE IN THE
LABORATORY*

SIBAJI RAHA

Indo-FAIR Co-ordination Centre

Kolkata &

Chair, Joint Scientific Council

FAIR & GSI - Darmstadt

Prominent features of FAIR accelerator

High Intensity beams:

1000 x

For primary HI beam

10 000 x

For radioactive ion beams

10 0 x

For antiproton beams

Primary beams:

10^{12} /s $^{238}\text{U}^{28+}$ 1-2 AGeV

$4 \cdot 10^{13}$ /s Protons 90 GeV

10^{10} /s U 35 AGeV (Ni 45 AGeV)

Secondary beams:

rare isotopes 1-2 AGeV

antiprotons up to 30 GeV

- Highest Beam Intensities

- Brilliant Beam Quality

- Higher Beam Energies

- Highest Beam Power

- 4 parallel operations

Existing GSI

p - LINAC

Synchrotrons
SIS100 SIS300

High-Energy Storage Ring
HESR

Compressed Baryonic
Matter (CBM)

Superconducting
large-acceptance
Fragment Separator
Super-FRS

Collector Ring
CR

Recycled Exp. Storage Ring
RESR

New Experimental Storage Ring
NESR

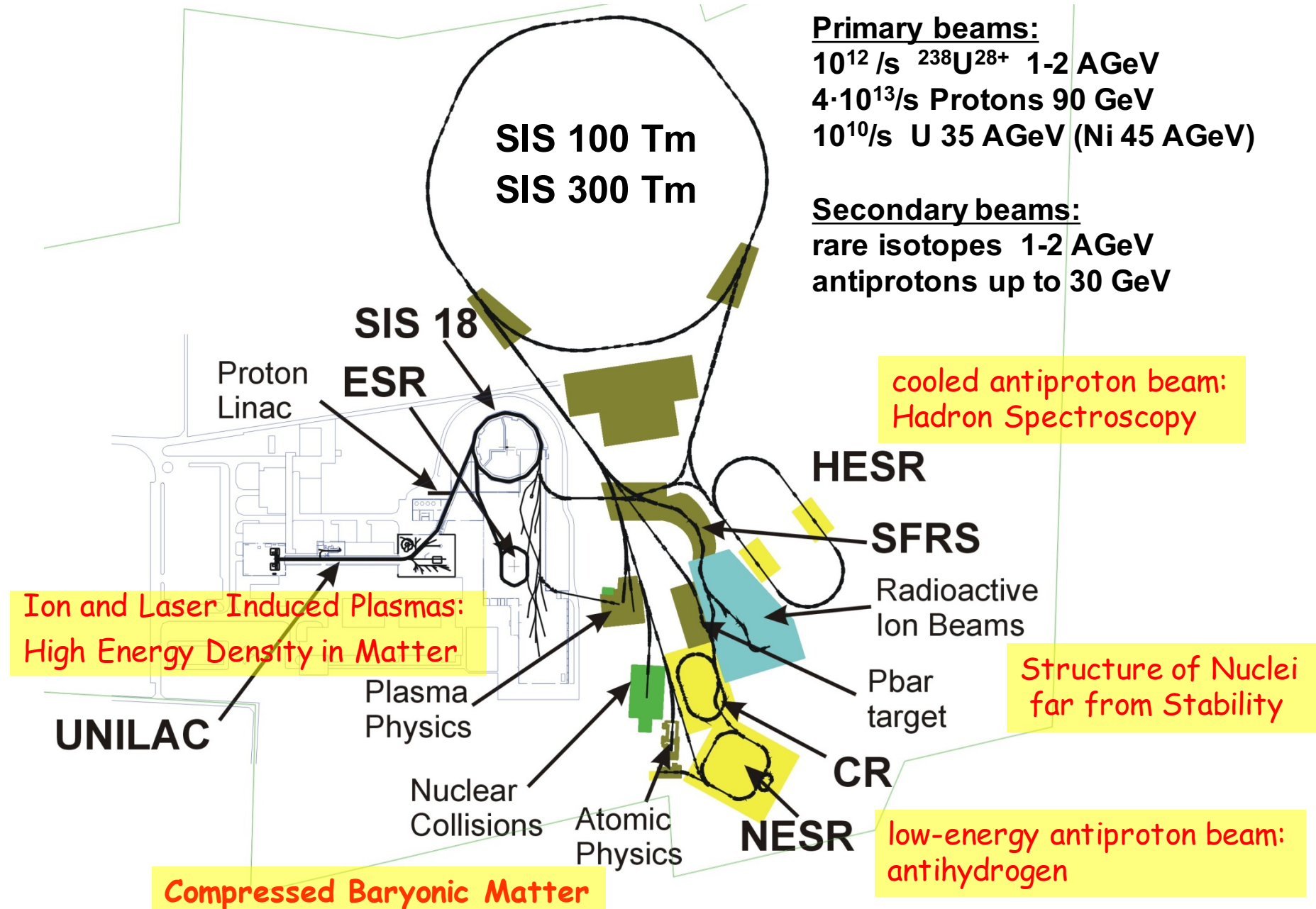
FAIR GmbH formed (convention signed) on 4th October



**Founder
countries:**

**Germany
Russia
India
France
Poland
Romania
Finland
Slovenia
Sweden**

Experiments at The future Facility for Antiproton and Ion Research (FAIR)



Four Primary Scientific Pillars:

Atomic, Plasma Physics & Applications (APPA)

Compressed Baryonic Matter (CBM)

Nuclear Structure, Astrophysics & Reactions
(NUSTAR)

Antiproton Annihilation at Darmstadt (PANDA)

While the focus is on fundamental studies, the practical and technological spin-off is of utmost importance. Applications play a major role in the planning of activities, present and future – both short and long term.

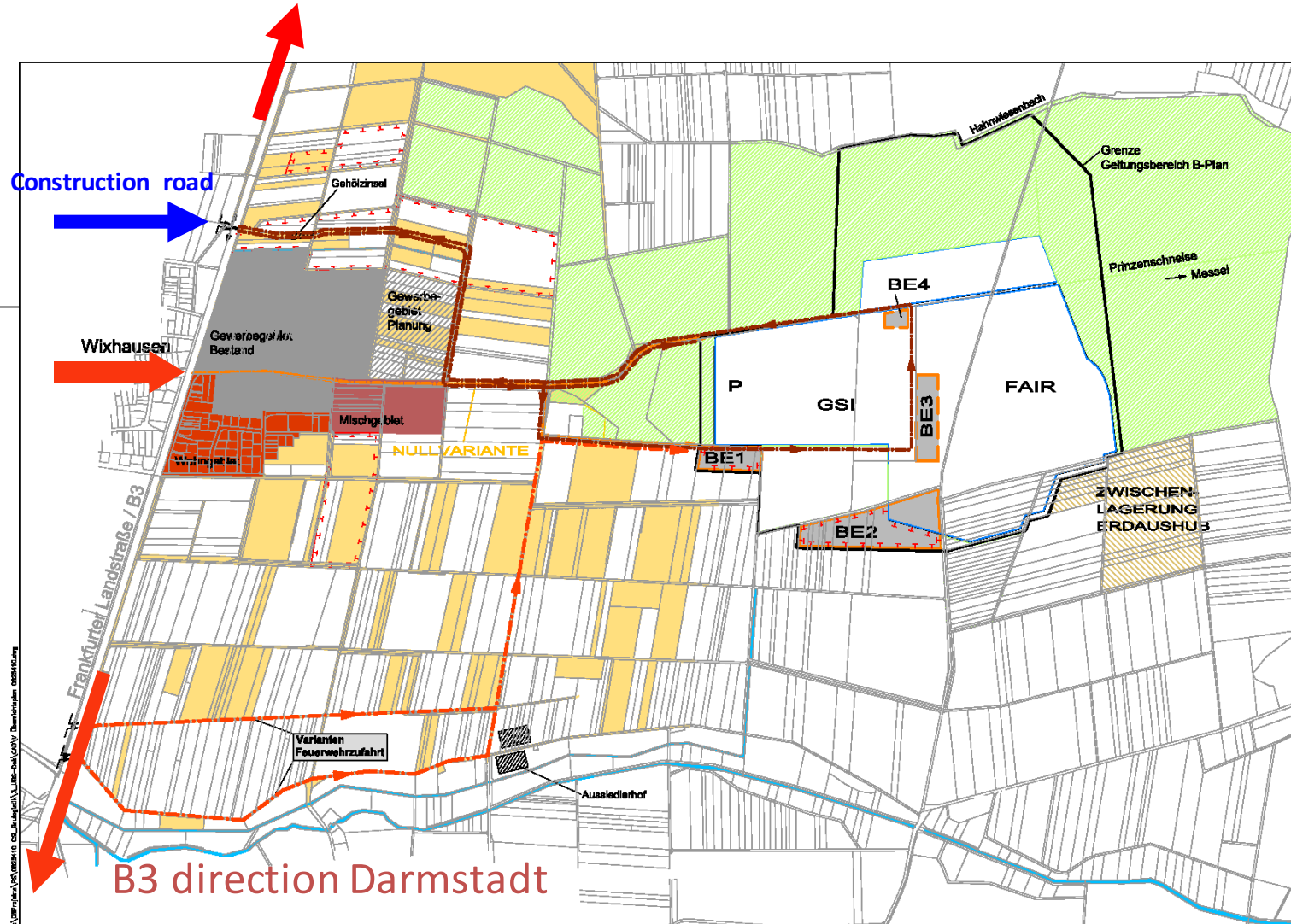
Council has imposed a cost and time cap, 1262 ME and 2025, respectively, for realisation of the MSV (Modularised Start Version). Hopefully, they would both be fulfilled.

Unique features of FAIR experiments

- Four parallel operations
- Wider range of research topics with a lot of discovery potentials
- Extremely high beam intensity
- Challenging detector requirements in hostile environment
- FRRC – FAIR Russia Research Centre,
More such centres are upcoming.

3000 + scientists from 50 countries.

B3 Direction Frankfurt



Construction road

Wixhausen

Frankfurter Landstraße / B3

B3 direction Darmstadt



Legende:

- Aufforstungsfläche (Ersatz)
- BE Baustellen-Einrichtungsfächen
- Städtische Grundstücke
- Wald
- Zwischenlagerung Erdaushub
- Baustellenerschließung über Messeler-Park-Str.
- Zusätzliche Baustellenerschließungstrasse
- Feuerwehrezufahrt

Umweltplanung Bullermann Schönele GmbH					
Erweiterung GSI, Projekt FAIR Konzept Verkehrliche Baustellenerschließung					
Übersichtslageplan					ZEICHNUMMER: 063101
					MASSSTAB: 1:5.000
PROJEKT Name	BEDAUERTE Bürger	BEFRAGTE Bürger	PROJEKT NR. 0625410	ENTWURF Feb. 2009	BEARBEITUNGSZEITRAUM 21.02.2011
AUFTRAGGEBER GSI GESELLSCHAFT FÜR SCHWERMETALLFORSCHUNG PLANCKSTRASSE 1, 64281 DARMSTADT			PLANCKSTRASSE UMWELTPLANUNG BULLERMANN SCHÖNELE GmbH HAVELSTRASSE 7A, D-64284 DARMSTADT TELEFON: 0611 810768-0 TELEFAX: 0611 810768-30		