

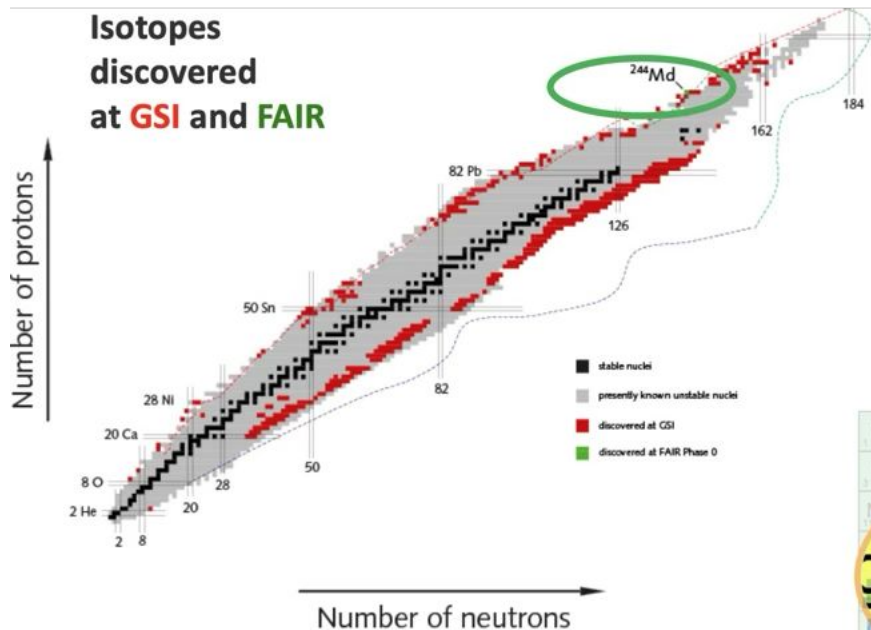
GGSB at GSI

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Production of new elements

Isotopes
discovered
at GSI and FAIR



- New chemical elements
- Hundreds of new isotopes
- New decay modes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
H	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	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Th	Pa	U	Np	Pu	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lanthanum	Ununseptium
107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124
Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og	119	120	121	122	123	124
bohrium	hassium	meitnerium	darmstadtium	roentgenium	copernicium	nihonium	flerovium	moscovium	tennessine	oganesson	unbinilium	untrium	unquadrium	unpentium	unhexium	unseptium	unoctium

■ natural

■ experimentally produced

■ discovered at GSI

■ at GSI

The UNiversal Linear Accelerator



Total length 120m





Construction volumes

2 million m³ of earth
600,000 m³ of concrete

to be moved

to be used

65,000 tons of steel

to be utilized

As much as for 5,000 single-family homes



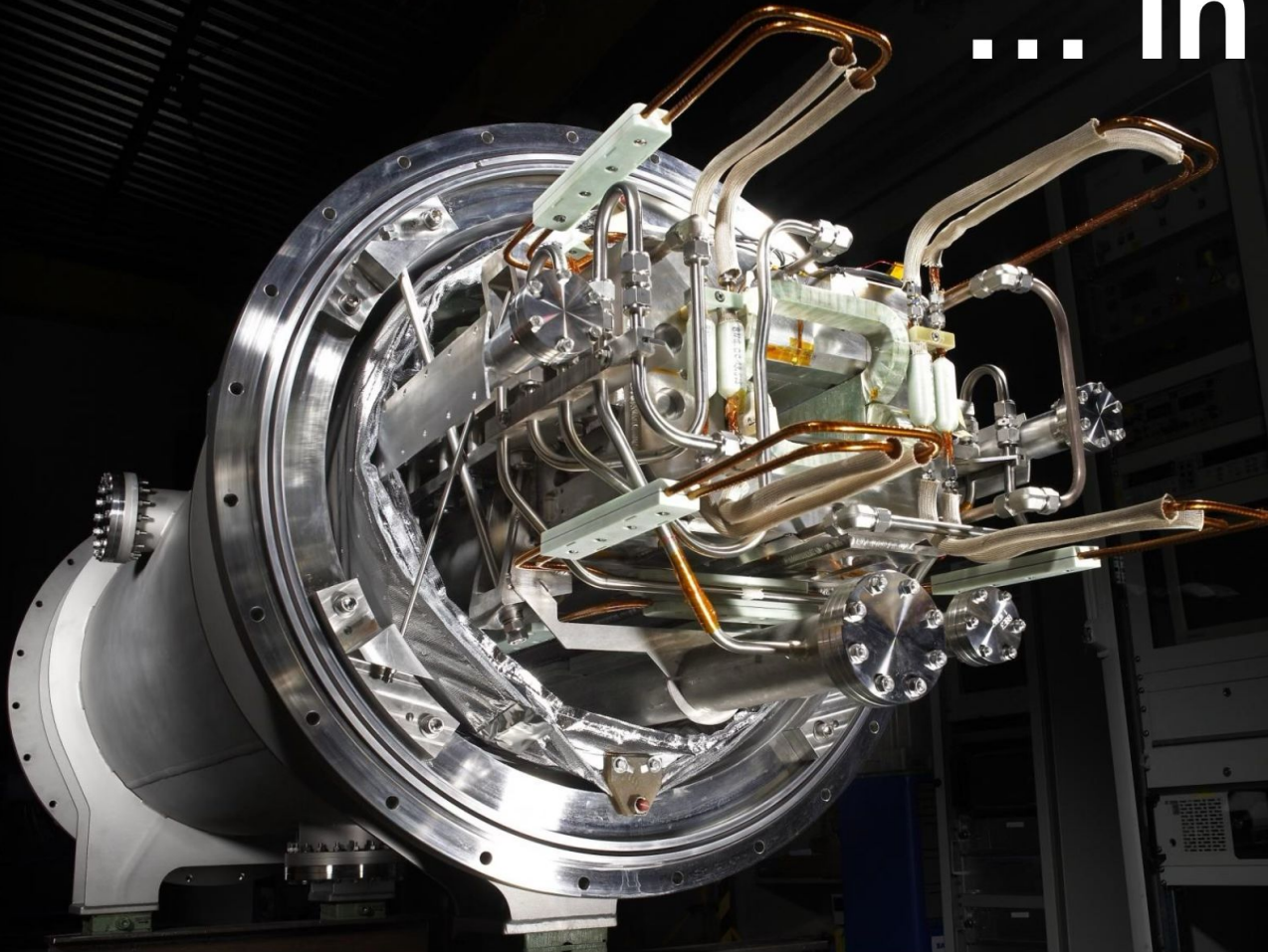
As much as eight Frankfurt soccer stadiums



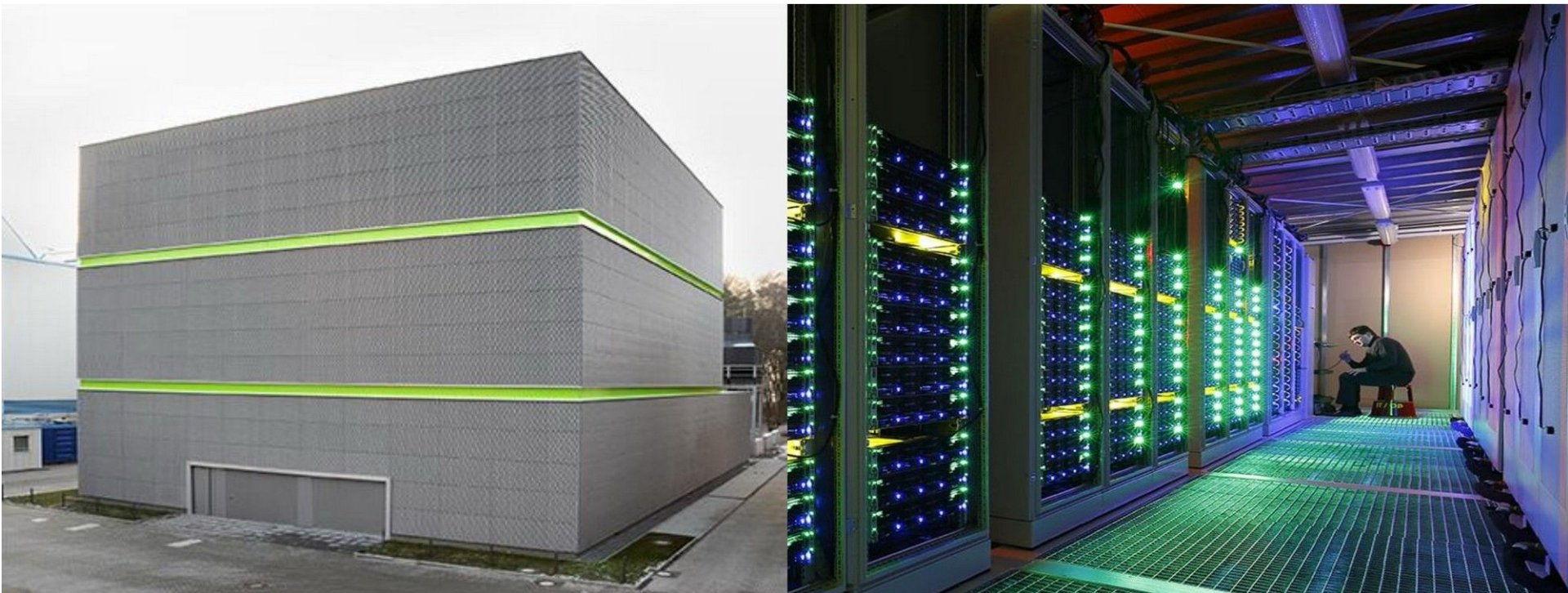
As much as nine Eiffel Towers



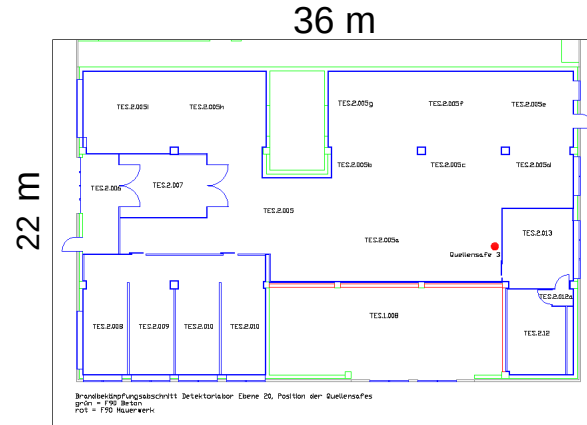
... in the lab.



High-performance scientific computing, Big Data, Green IT

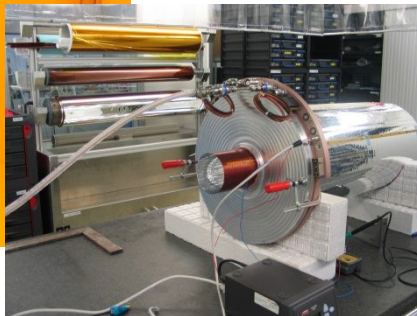
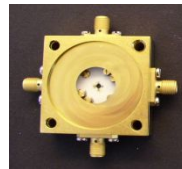
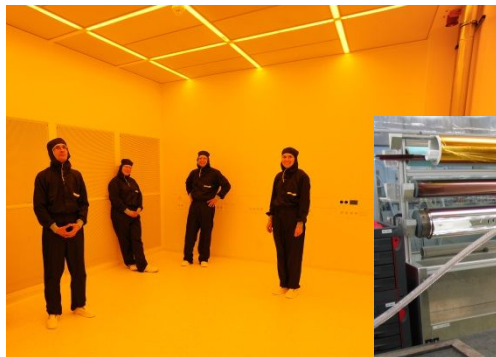


Detector Laboratory: 600 m² Clean-Room



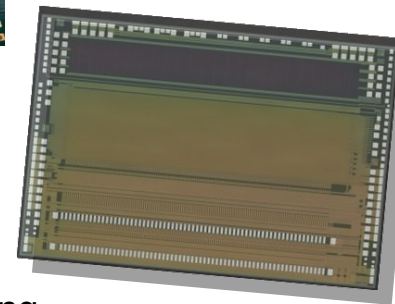
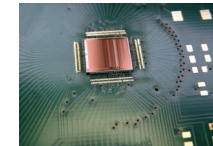
Competences:

- Micro Patterned Gaseous Detector Technology
- Silicon Strip Detector Integration
- ASIC Handling and Integration
- Diamond Detectors

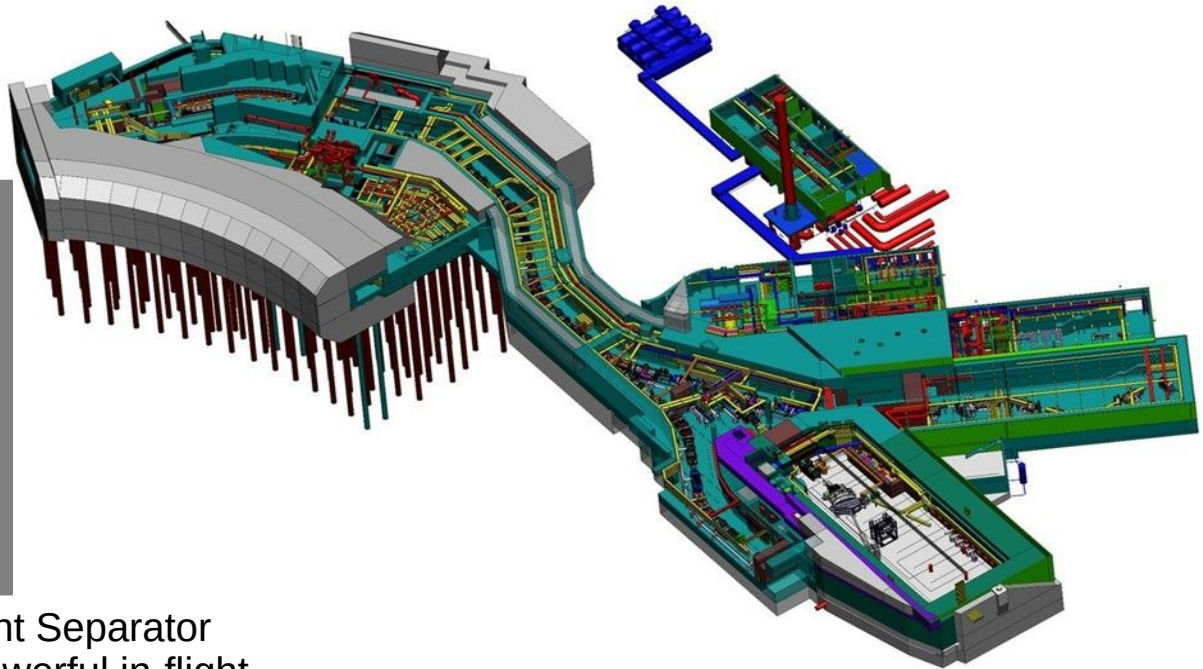
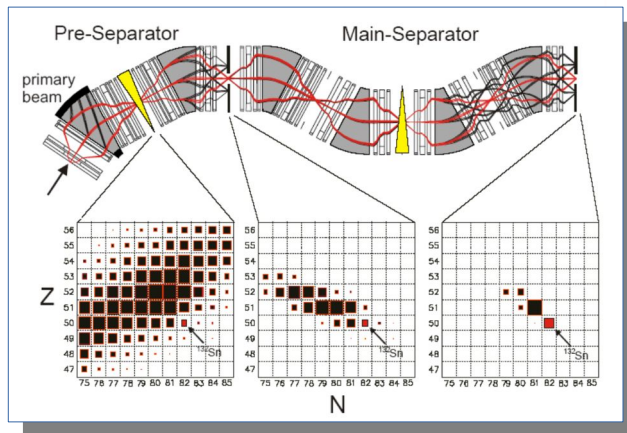


Machinery:

- Laser Lithography
- PVD
- Bonding Automates
- Probestation and Chip Handling
- Automated Wire Winding
- Digital Microscope
- Thin Foils Handling and Processing
- Detector Ageing Teststands
- Large Prototyping CNC Milling Machine



Super-FRS stands for **Super** (conducting) **F**Ragment **S**eparator



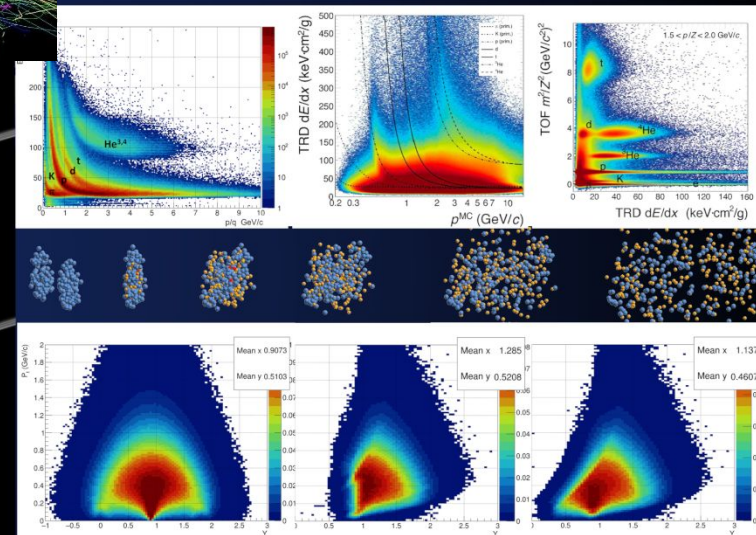
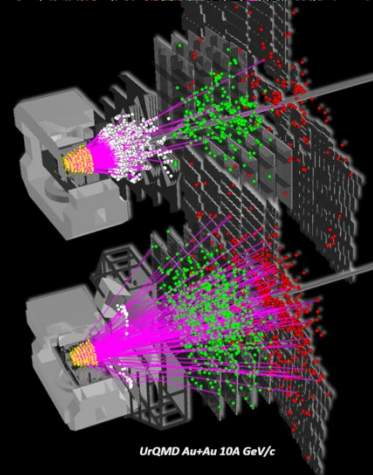
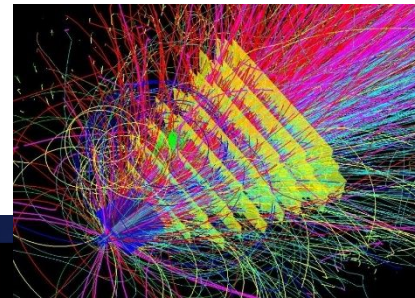
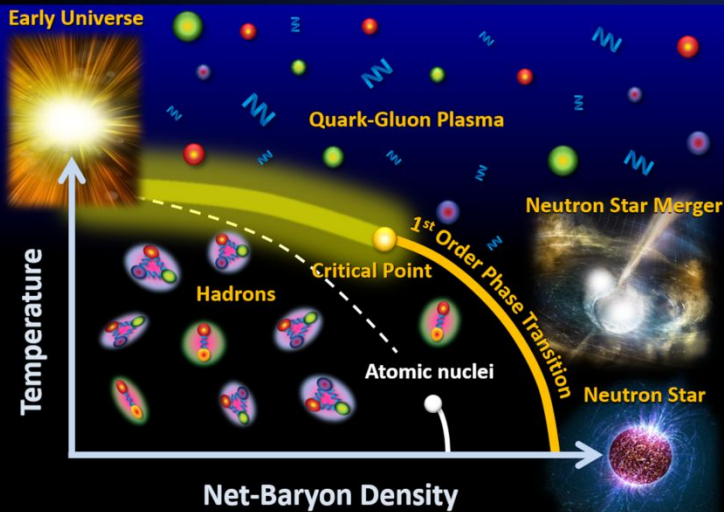
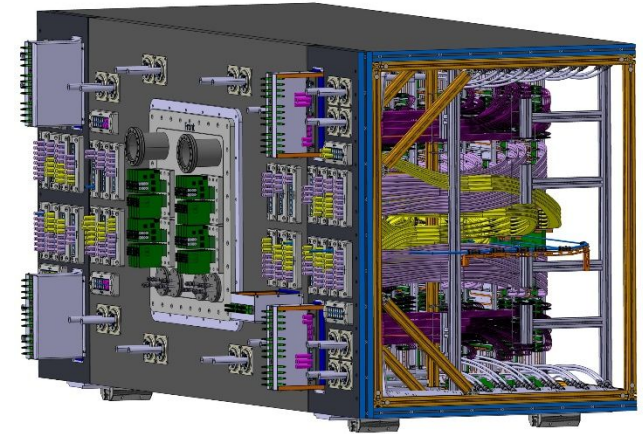
The Super-conducting FRAgment Separator (Super-FRS) will be the most powerful in-flight separator in the world. Rare isotopes of all elements up to uranium will be produced at relativistic energies and spatially separated within a few hundred nanoseconds, enabling the study of very short-lived nuclei. The Super-FRS is the central device of the NUSTAR collaboration.

- ~ 365m Beamline
- 38 Pneumatic and 5-Phase Motor Actuators
- 8 Focal Areas
- 53 Detectors (incl. Target)

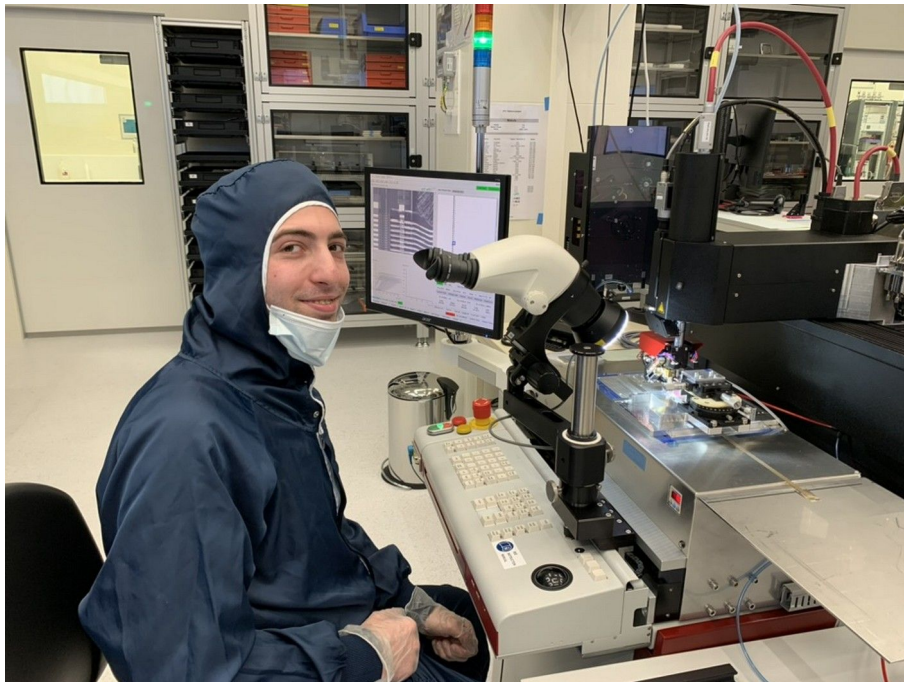


CBM Compressed Baryonic Matter

- 896 silicon strip detector modules for tracking, 2M ch
- assembled to guarantee $< 1.5 \Delta p/p$
- electronics outside acceptance



Nika & Otari

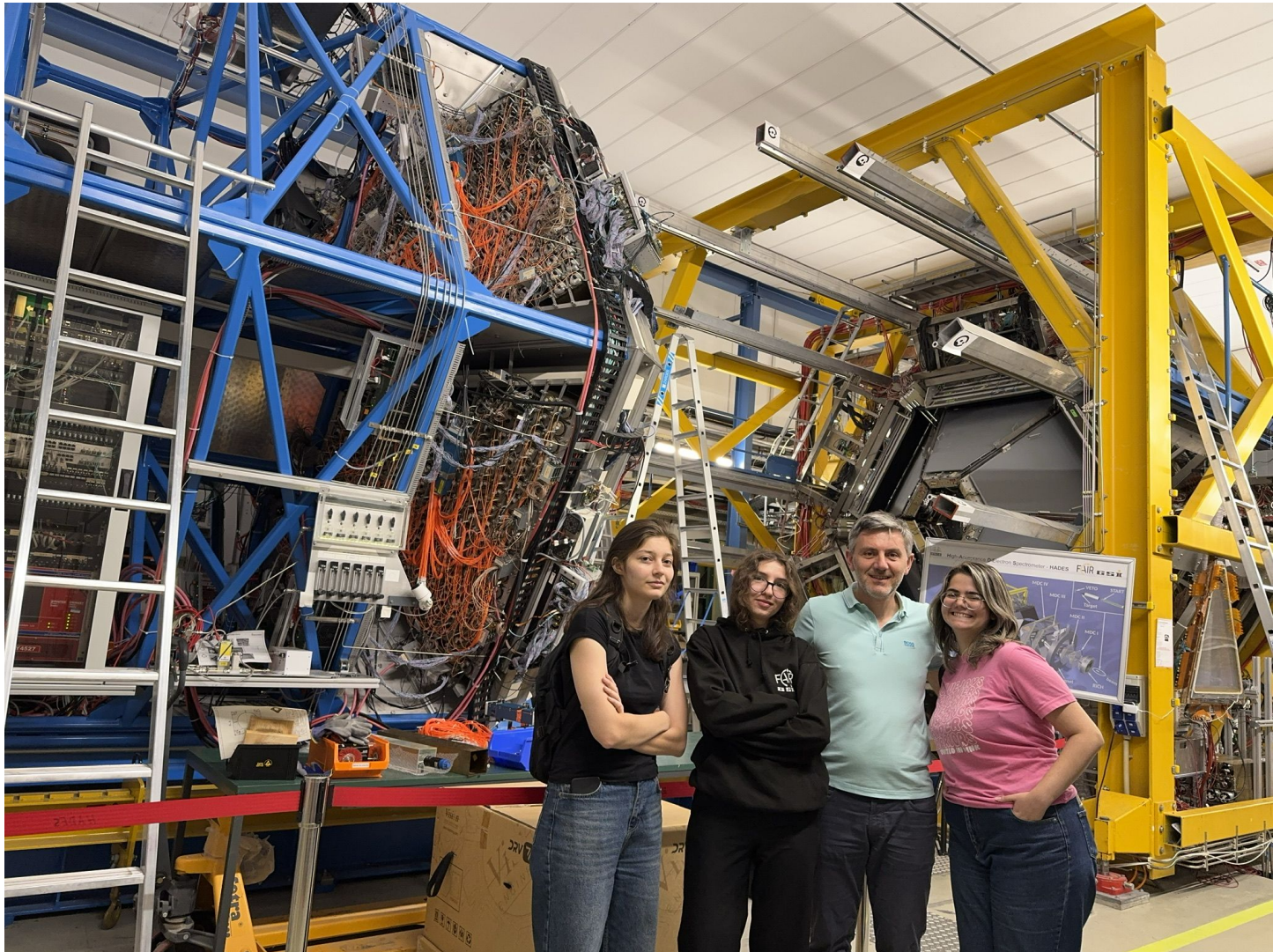


David & Dachi









FAIR — Facility for Antiproton and Ion Research in Europe

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The new large scale accelerator facility in Europe

Overview on FAIR | **Studies & Career** | Press | About us | Business partners | User

Path: »Studies & Career»GET_Involvement»Who can participate?

Career

Job Offers

FAIR Fellow and Associate Program

GET_Involvement Programme

- » News and Calls
- » Why to GET_Involvement
- » Who can participate?
- » GSI: Short-term Internship Programme
- » GSI: ERASMUS+ Traineeship Programme
- » GSI: Sandwich PhD Doctoral Research Programme
- » How to become a partner
- » What you can do (subjects)
- » How to apply?
- » Lectures and Seminars
- » Opportunities for Applicants
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Studying Opportunities

Ausbildungsstelle (Apprenticeship)

Joint Outreach Office

Betriebspraktika (Internship)

Working at FAIR and GSI

Young scientists at a SIS100 dipole magnet to be used for the FAIR ring accelerator

GET_Involvement - Who can participate

The GET_Involvement Programme consists of various Programme. This page allows you to orient to an appropriate programme based on your educational qualification, affiliation to a specific institute/university and country of origin. Please select one of the suitable category before you submit an application.

- Category A: students and recent graduates
- Category B: doctoral and postdoctoral researchers
- Category C: visiting scientists and scientific staff
- Category D: partner programme
- Speculative Applications from those who cannot find any suitable Programme or fitting opportunity

Contact for more details:

Email: [get_involved\(at\)gsi.de](mailto:get_involved(at)gsi.de)

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Students and recent graduates

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FAIR

The new accelerator facility FAIR is under construction at GSI. [Learn more.](#)

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Research for Grand Challenges

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Focus on cosmic radiation: ESA and FAIR invite to the 2026 Space Radiation Summer School in Darmstadt

Professor Thomas Nilsson, Scientific Managing Director of GSI and FAIR, welcoming participants to the ESA-F...

25.08.2026 | How can astronauts and satellites be protected from cosmic radiation? What part do particle accelerators play in this? These questions are the focus of the "ESA-FAIR Space Radiation Summer School 2026", which is currently being held in Darmstadt. This renowned event is the world's leading training program in the field of space radiation research and brings together young researchers from more than ten countries to spend two weeks intensively addressing the challenges posed by cosmic radiation. The summer school is a unique collaboration between the European Space Agency (ESA) and the international accelerator center FAIR, which is currently under construction at the GSI Helmholtzzentrum für Schwerionenforschung, and is organized by Professor Marco Durante and his space radiation research team at GSI/FAIR's Biophysics Department.

The program offers an exclusive program at the interface of basic research and applied space technology. In focus: research of cosmic rays and their effects on humans, materials, and electronics—a key topic for safe spaceflight and long-term missions, such as those to the Moon or Mars.

During the Summer School, participants get to know both locations: The first week focused on activities at ESA's European Space Operations Center (ESOC), where they have a dense program of lectures and site visits. In the second week, the young researchers moved to the GSI/FAIR campus where they focus on hands-on, experimental activities in space radiation research. At the end of the Summer School, they will also visit the European Astronaut Center (EAC) in Cologne. The final test is a real experimental proposal for beamtime at the GSI/FAIR facility with a n experiment addressing open gaps in space radiation research. Professor Marco Durante, Head of the GSI/FAIR Department of Biophysics, for FAIR and Dr. Anna Fogtman for ESA will evaluate the proposals and give awards to the best ideas submitted.

The scientifically outstanding program was opened by Dr. Piers Jiggins, Science Lead for Radiation at

Wissenschaft für Alle

Wed. September 16, 2026 | 2 p.m.

Wie schaut es die KI wirklich? – Eine Übersicht über die Entwicklung der KI und das heisse KI-Ökosystem

Wolfgang Heines, heines@... | Registration and further information

SCIENCE POP-UP

open Tue – Fri, 12 am – 5 pm

Sat. September 12, 10:30 am – 4:00 pm

City Center Darmstadt, Ernst-Ludwig-Str. 22

FAIR Trailer: The Partner's Journey through the Accelerator Facility

Drone Flight over the FAIR construction site

Guided tour at GSI/FAIR — book now!

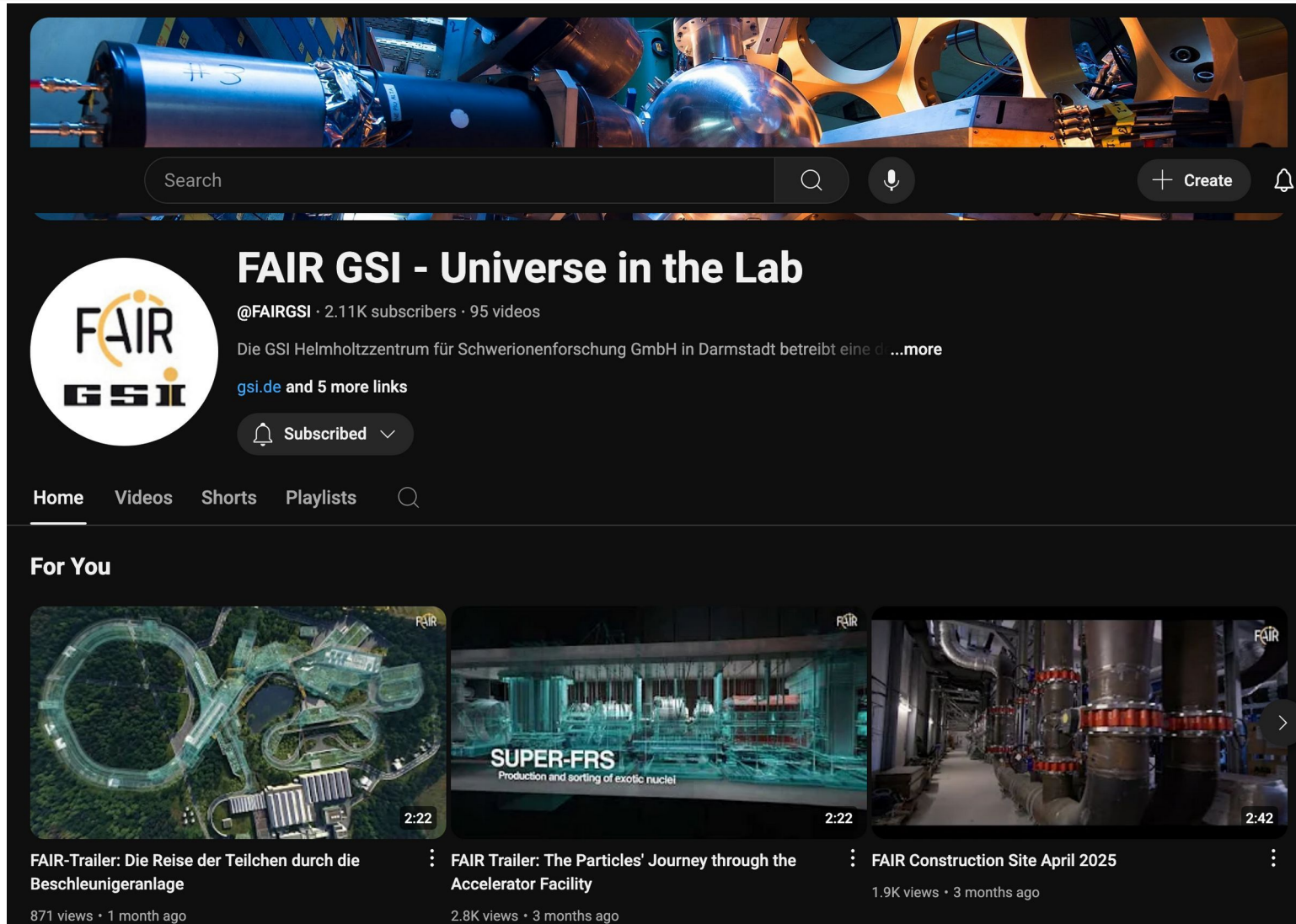
2026 SCIENCE FESTIVAL FRANKFURT

September 19, 2026 10 a.m. – 7 p.m.

Rosemarkt, Frankfurt a.M.

Blog Beam On

People behind GSI and FAIR



The image shows the YouTube channel page for "FAIR GSI - Universe in the Lab". The header features a banner image of a particle accelerator component. Below the banner is a search bar and a "Create" button. The channel's profile picture is the FAIR GSI logo. The channel name "FAIR GSI - Universe in the Lab" is prominently displayed, followed by the handle "@FAIRGSI", 2.11K subscribers, and 95 videos. A description in German states that the GSI Helmholtzzentrum für Schwerionenforschung GmbH in Darmstadt operates a... more. Below the description are links to "gsi.de" and 5 more links. A "Subscribed" button with a bell icon is visible. The navigation menu includes "Home", "Videos", "Shorts", and "Playlists". The "For You" section displays three video thumbnails: 1. "FAIR-Trailer: Die Reise der Teilchen durch die Beschleunigeranlage" (871 views, 1 month ago), 2. "FAIR Trailer: The Particles' Journey through the Accelerator Facility" (2.8K views, 3 months ago), and 3. "FAIR Construction Site April 2025" (1.9K views, 3 months ago).

Search

+ Create

FAIR GSI - Universe in the Lab

@FAIRGSI · 2.11K subscribers · 95 videos

Die GSI Helmholtzzentrum für Schwerionenforschung GmbH in Darmstadt betreibt eine d...more

[gsi.de](#) and 5 more links

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For You

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