

NEXT *Level* for **NEXT** *Gens*

HZDR
HELMHOLTZ ZENTRUM
DRESDEN ROSSENDORF

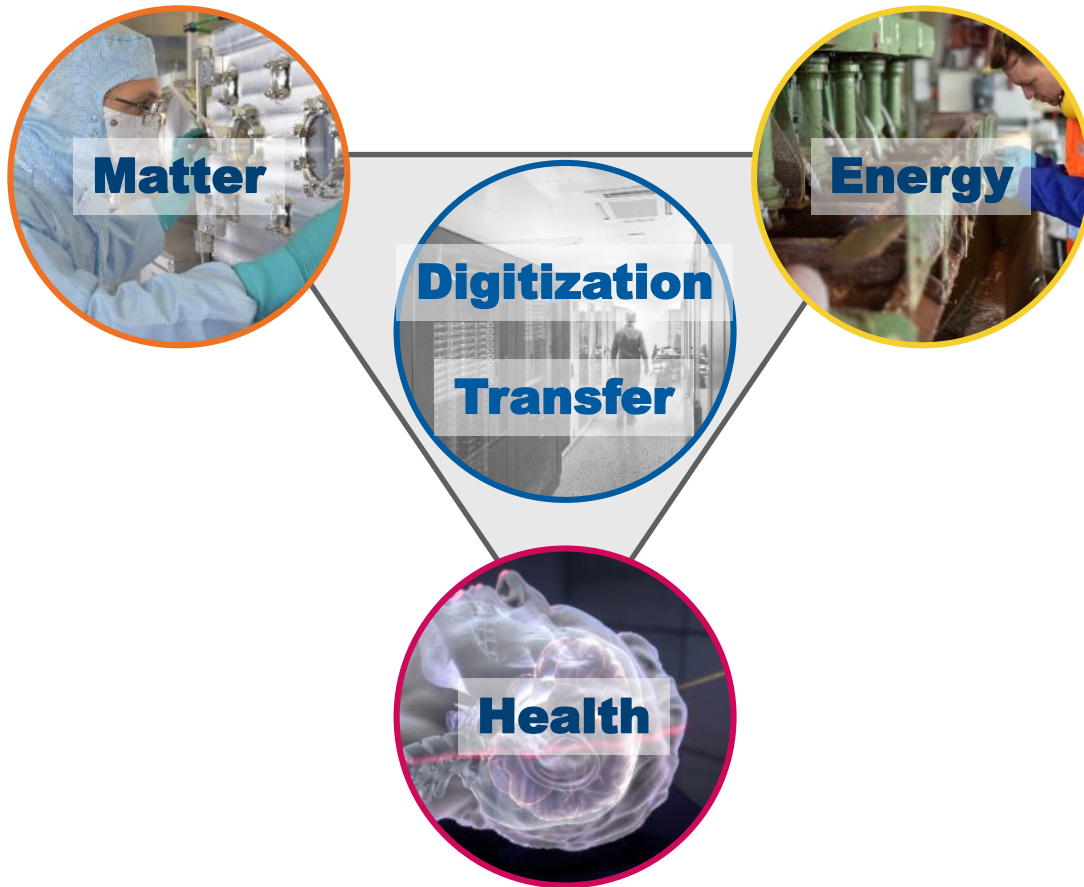


Cutting-Edge Research @ HZDR

Helmholtz-Zentrum Dresden-Rossendorf

Board of Directors: Prof. Dr. Sebastian M. Schmidt | Dr. Diana Stiller | Helmholtz-Zentrum Dresden-Rossendorf





The HZDR faces the **grand challenges of our time** by providing knowledge and technologies for the next generations in order to:



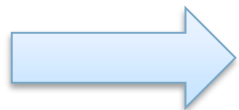
develop diagnostic and therapeutic methods to combat **cancer**,



support the transition to sustainable industry through **resource and energy efficiency**, and



research **future materials and technologies** and develop them to the point of application.



Complex research infrastructures

International talents

→ Close collaborations in science and industry

Founding

1956 - ZfK
1992 - FZR
2011 - HZDR

Budget

ca. 120 Mio. € (90:10)
+ca. 30 Mio. € 3rd party-f.

Research

Transformation of
Energy System
Health Research
Materials and Technologies

Personnel

1437 in total (08/2021)

480 Scientists
40 Professors
149 Postdocs
189 PhD

226 Technical Staff

More than 60 Nationalities

Transfer

Own exploitation company
HZDRI
ca. 5 Mio € Revenue

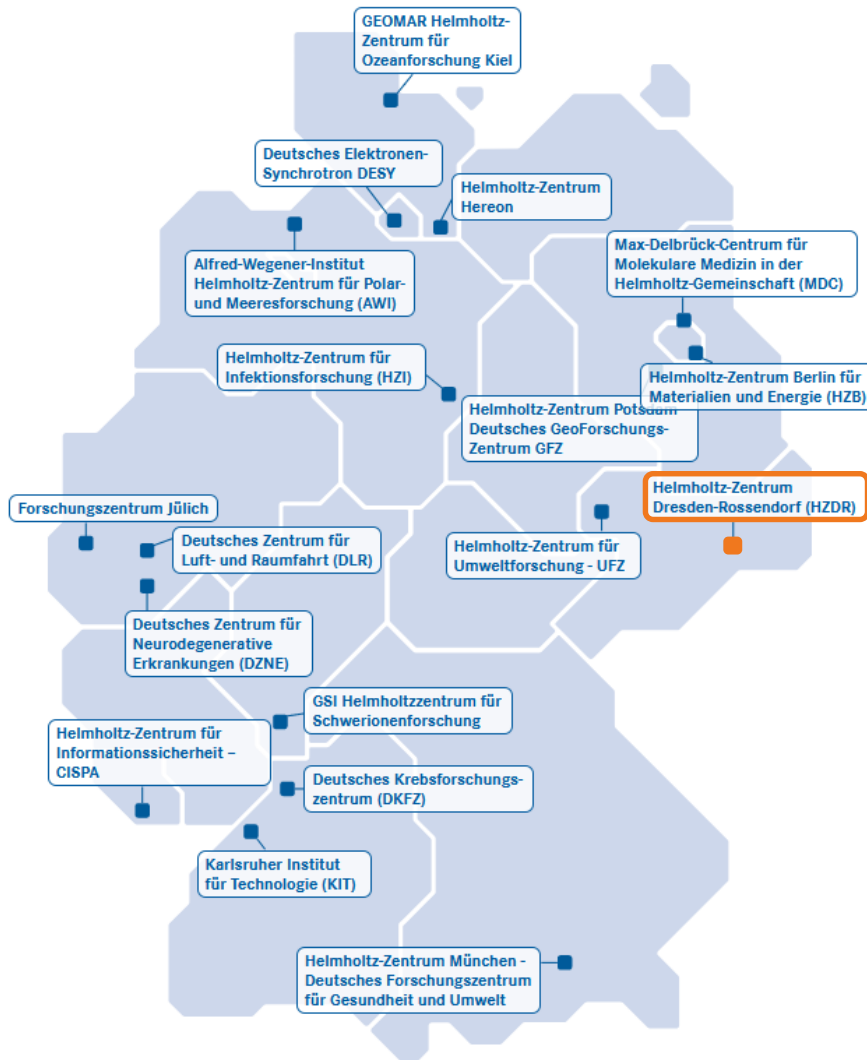
Research Sites

Dresden, Freiberg, Görlitz
Leipzig, Grenoble (ESRF),
Schenefeld near Hamburg (XFEL)

Strategy

2030+

- Complex and unique large RIs in user operation (peer-review)
- International talents
- Close cooperation with science and industry



- Created in 1995
- **18 autonomous Helmholtz Centers**
- Total annual **budget** of 5 billion euros
- Around 43.000 **employees**
- annually around 2.000 joint projects with **business enterprises**
- **6 research areas:**
 - Energy
 - Earth & Environment
 - Health
 - Aeronautics, Space and Transport
 - Matter
 - Information

HZDR – Member of the Helmholtz Association

HELMHOLTZ
RESEARCH FOR GRAND CHALLENGES



ENERGY



HEALTH



MATTER



Board of Directors

Prof. S. M. Schmidt
Dr. D. Stiller



Institute of Fluid Dynamics

Dr. G. Gerbeth



Institute of Radiation Physics

Prof. T. E. Cowan
Prof. U. Schramm



Institute of Theoretical Physics

Prof. R. Schützhold



CITO Chief Innovation Transfer Officer

Dr. B. Wolf



Department of Information Services and Computing

Dr. U. Konrad



Institute of Resource Ecology

Prof. T. Stumpf



Institute of Radiopharma- ceutical Cancer Research

Prof. K. Kopka
Prof. M. Bachmann



Dresden High Magnetic Field Laboratory HLD

Prof. J. Wosnitza



Department of Research Technology

Prof. P. Kaefer



Helmholtz Institute Freiberg for Resource Technology

Dr. J. Gutzmer



Institute of Radiooncology – OncoRay

Prof. M. Krause

HZDR
HELMHOLTZ ZENTRUM
DRESDEN ROSSENDORF



Institute of Ion Beam Physics and Materials Research

Prof. M. Helm
Prof. J. Fassbender



CASUS – Center for Advanced Systems Understanding

Prof. R. Sauerbrey



HLD – High Magnetic Field Laboratory Dresden

- modern materials research in high magnetic fields
- 114 project proposals for 7.006 magnetic pulses in 2021, 75% external users

ELBE – Photon and particle source

- compact, accelerator-driven particle and photon source
- 3.800 hours of beamtime with 71% external users in 2021



IBC – Ion Beam Center

- Facilities for ion implantation, ion- and plasma-enhanced layer deposition and ion beam analysis
- 14.167 hours of beamtime with 66% external users, thereof 76% industry (2021)

DRACO and PEnELOPE – High-power Laser-particle Acceleration

- Lasers with maximum power in the PW range



DRACO & PEnELOPE



HIBEF – Helmholtz International Beamline for Extreme Fields)

- Experiments at the High Energy Density (HED) Beamline of the European XFEL
- Inauguration and start of user experiments in 2021

ROBL – Rossendorf Beamline @ ESRF


- Experimental stations for radiochemical experiments





 **ZRT** – Center for Radiopharmaceutical Tumor Research




 **TOPFLOW** – Transient Two Phase Flow Test Facility


- Investigation of complex flow phenomena under realistic industry-relevant conditions

 **Metallurgy Pilot Plant** Freiberg



 **DRESDYN** – (DREsden Sodium facility for DYNamo and thermohydraulic studies)

- Large-scale liquid sodium experiments with geo- and astrophysical background

 **Felsenkeller** Lab

- 5 MV underground accelerator for experiments in nuclear astrophysics



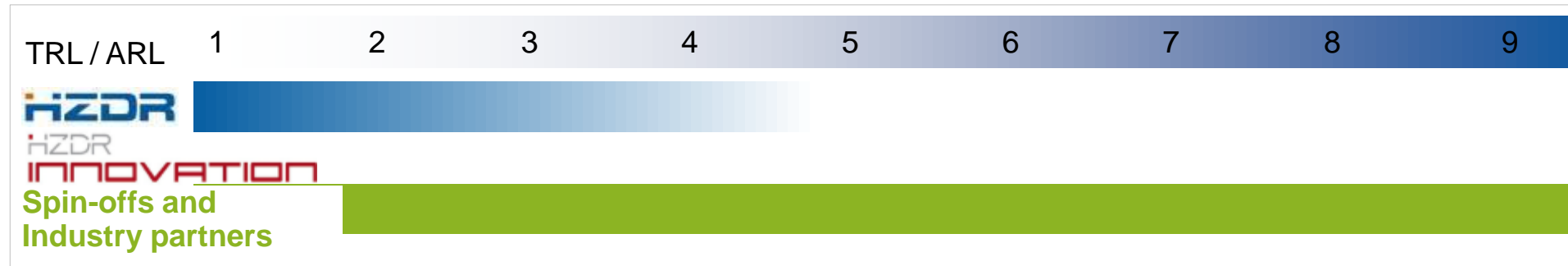
 **HPC** - High Performance Computing



- Successful spin-off with > 60 employees (2020):

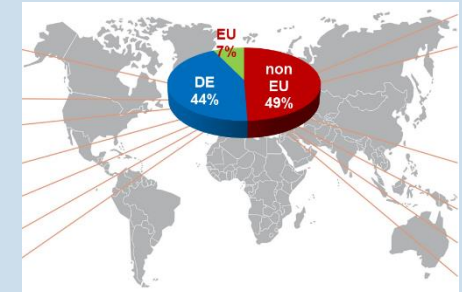
Service for industry via

HZDR
INNOVATION



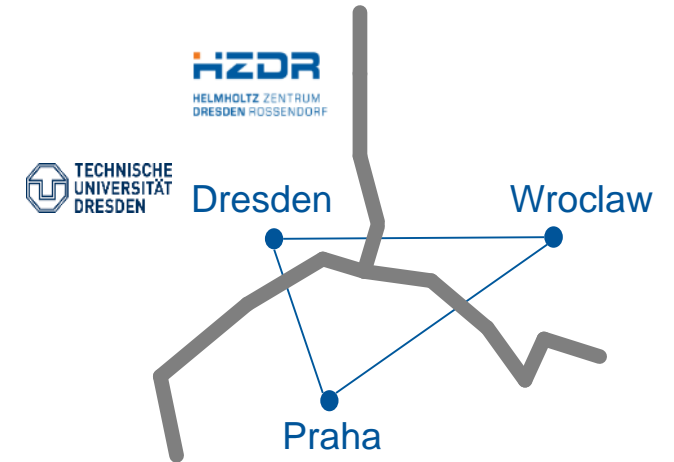
Success Stories Transfer:

- HZDR Ion Beam Center** – main supplier for the European semiconductor industry for special applications with high revenues for HZDR
– irradiation of 200.000 Wafer/year; about 1.2 Mio. EUR user fees for HZDR
- EIT RawMaterials** – coordinator in the build-up phase of the world's largest consortium in the raw materials sector
- [123]loflupan** – Parkinson's diagnostic from the laboratory to the patient (first patent dose in November 2020)



HZDR – Local Partners and Partners around the Globe

- Securing competences through partnerships
- Networking at **local**, **national** and **international** level
- **DRESDEN-concept**-Network as strong local advantage
- Strategic cooperative relationships in the border triangle Germany – Poland - Czech Republic;
e.g. connection Dresden – Görlitz – Wrocław at **CASUS**





- Versatile potential for scientific cooperation
- Student exchange
- Joint events and workshops

Signing MoU in
May 2022 @
OncoRay

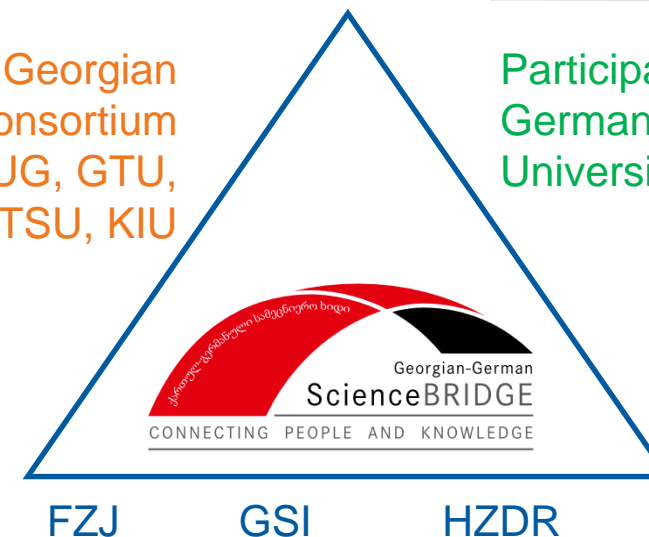


Possible fields of cooperation

- Hadron Therapy Center W. Enghardt
Radiooncology, Radionuclide production
- SMART Tech_Lab P. Kaefer/ G. Wedel
Research Technology
- Radiation Physics J. Fassbender
- Accelerator Physics, Fluid Dynamics,...

The Georgian
Consortium
AUG, GTU,
ISU, TSU, KIU

Participating
German
Universities



NEXT *Level* for **NEXT** *Gens*

HZDR
HELMHOLTZ ZENTRUM
DRESDEN ROSSENDORF



Cutting-Edge Research @ HZDR

Helmholtz-Zentrum Dresden-Rossendorf

Board of Directors: Prof. Dr. Sebastian M. Schmidt | Dr. Diana Stiller | Helmholtz-Zentrum Dresden-Rossendorf

