

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

**HZDR**  
HELMHOLTZ ZENTRUM  
DRESDEN ROSSENDORF



# Research for the World of Tomorrow

Georgian-German Science Bridge | August 18, 2025

Board of Directors: Prof. Dr. Sebastian M. Schmidt · Dr. Diana Stiller · [www.hzdr.de](http://www.hzdr.de)





# RESEARCH FOR THE WORLD OF TOMORROW

**The Helmholtz-Zentrum Dresden-Rossendorf**

Sebastian M. Schmidt · Scientific Director



# HZDR

## Application-oriented Basic Research

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



... develop **radiation based** diagnostic and therapeutic methods to combat **cancer**



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



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



Complex research  
infrastructures



International Talents



Close collaborations in  
science & industry

### Research Site



- since 1956
- Federal Republic and State of Saxony

### Statistics 2024



**800** Publications  
**30** *Nature*-Publications  
**11** Patent registrations  
**8** Mio. € Industry revenues

### Locations



- Dresden
- Freiberg
- Grenoble (ESRF)
- Schenefeld (XFEL)
- Görlitz
- Leipzig

### Personnel



**1.500** Total  
**500** Scientists  
**40** Professors  
**300** PhDs  
**42** Apprentices  
**70+** Nationalities

### Budget



- ca. 130 Mio. € (90:10)
- ca. 50 Mio. € 3rd party funding

### Transfer



- Entrepreneurship company
- 8 Mio. € Industry revenues



# HZDR

## Facts & Figures

### Research Site



- since 1956
- Federal Republic and State of Saxony

### Statistics 2024



**800** Publications  
**30** *Nature*-Publications  
**11** Patent registrations  
**8** Mio. € Industry revenues

### Locations



- Dresden
- Freiberg
- Grenoble (ESRF)
- Schenefeld (XFEL)
- Görlitz
- Leipzig

### Personnel



**1.500** Total  
**500** Scientists  
**40** Professors  
**300** PhDs  
**42** Apprentices  
**70+** Nationalities

### Budget

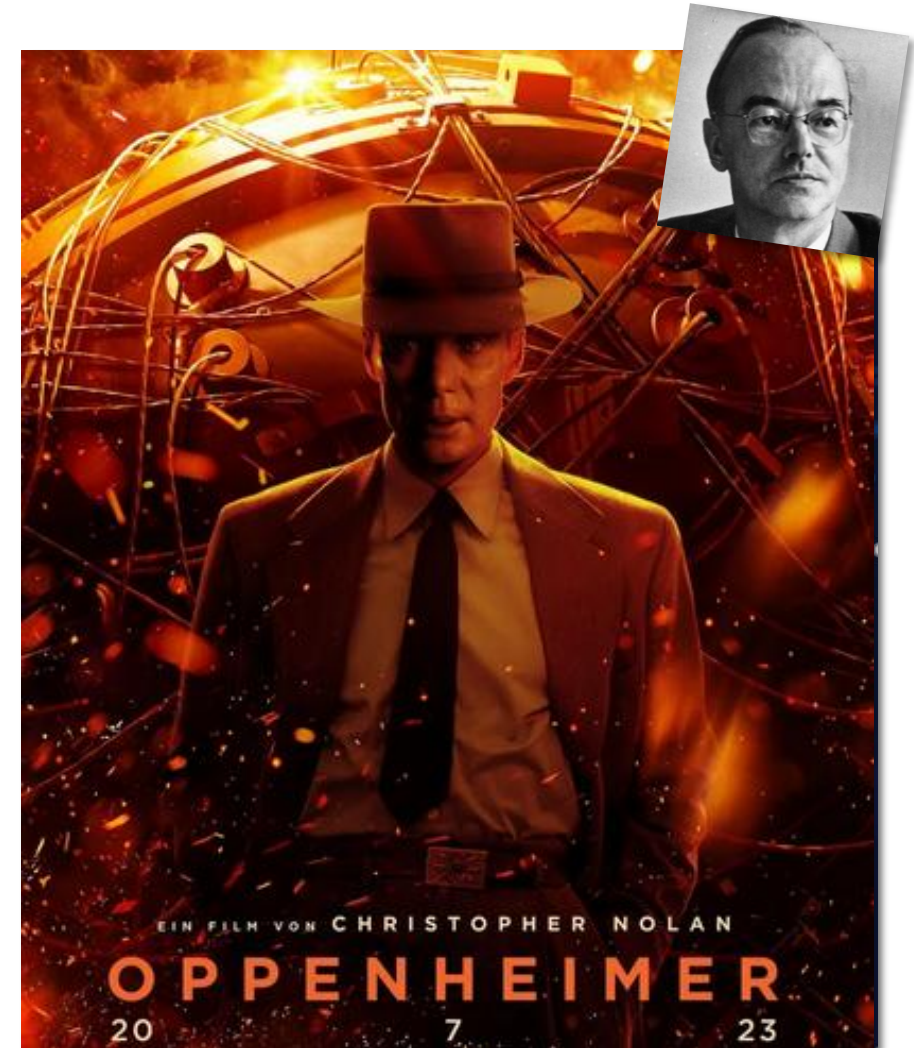


- ca. 130 Mio. € (90:10)
- ca. 50 Mio. € 3rd party funding

### Transfer



- Entrepreneurship company
- 8 Mio. € Industry revenues





**Supervisory Board**  
Dr. Peter Schroth  
Dr. Babett Gläser

**Scientific Advisory Board**  
Prof. Ralph Aßmann



**Board of Directors**  
Prof. S. M. Schmidt  
Dr. D. Stiller

### ENERGY

### MATTER

### HEALTH



Institutes



**Resource Ecology**  
Prof. T. Stumpf



**HI Freiberg for Resource Technology**  
Prof. J. Gutzmer



**Ion Beam Physics and Materials Research**



Prof. M. Helm  
Prof. J. Fassbender



**Theoretical Physics**  
Prof. R. Schützhold



**Dresden High Magnetic Field Laboratory**  
Prof. J. Wosnitza



**Radiooncology – OncoRay**  
Prof. M. Krause



**Radiopharmaceutical Cancer Research**  
Prof. K. Kopka



Prof. T. Kühne

**CASUS**

Center for Advanced Systems Understanding



**Fluid Dynamics**

Prof. K. Eckert  
Prof. U. Hampel



**Radiation Physics**

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

Departments



**Information Services and Computing**  
Dr. U. Konrad



**Research Technology**  
Prof. P. Kaefer



**Technical Services**  
D. Reichelt

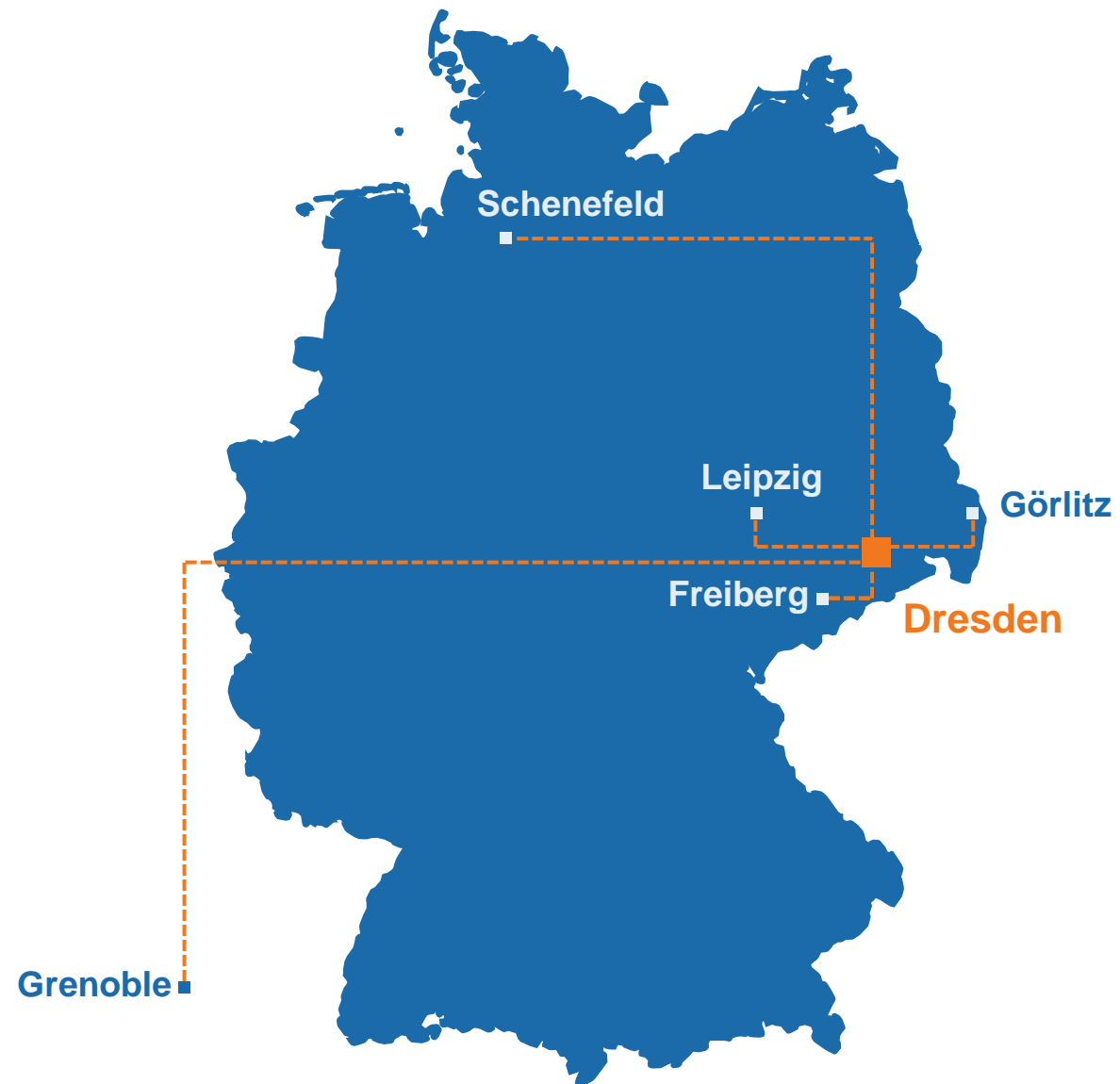
CITO



**Chief Innovation & Transfer Officer**  
Dr. B. Wolf

# HZDR

Research Infrastructure at 6 locations



# HZDR

Research Infrastructure at 6 locations



**HiBEF**

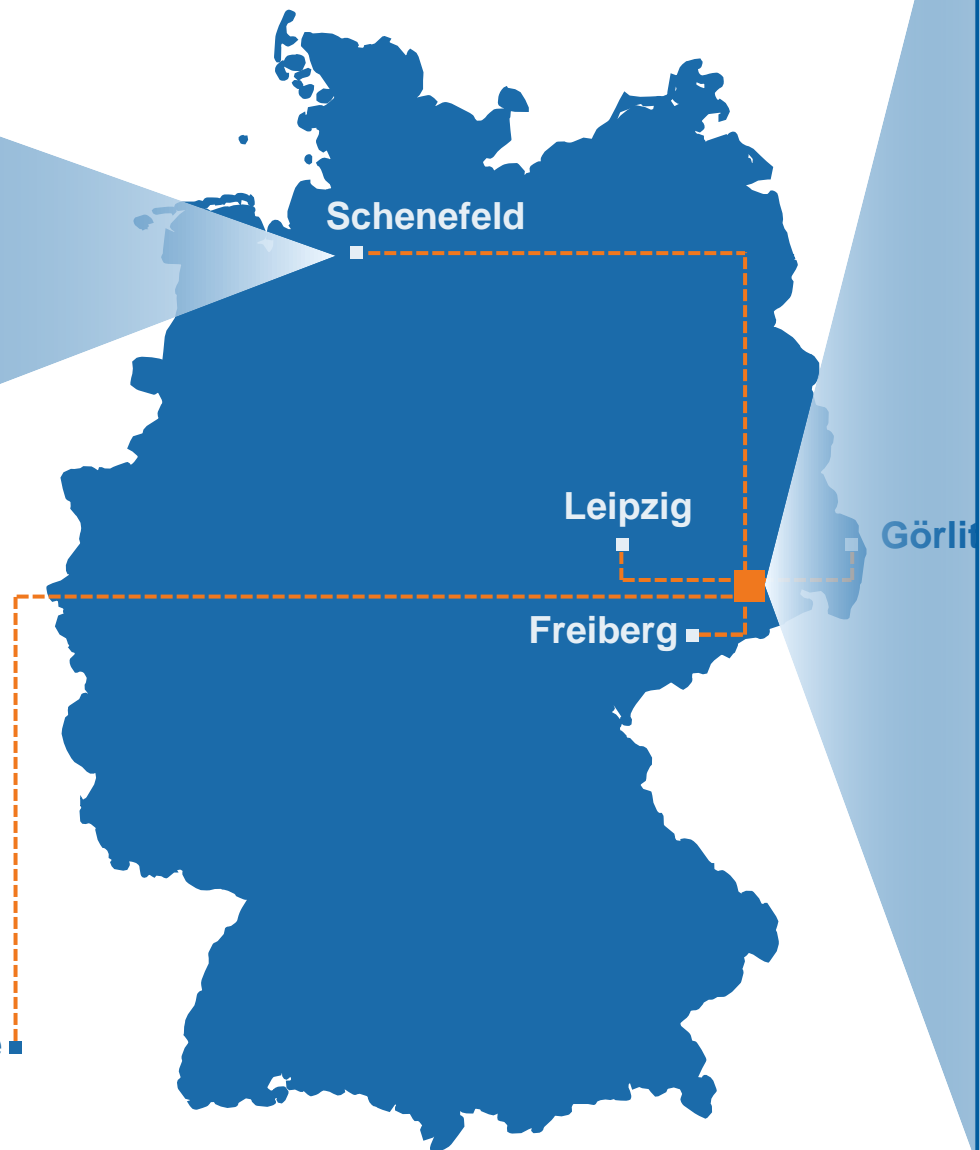
Helmholtz International Beamline for  
Extreme Fields @ European XFEL



**ROBL**

Rossendorf Beamline @ ESRF

Grenoble



Schenefeld

Leipzig

Freiberg

Görlitz



**HLD**



**IBC**



**ELBE**



**DRACO & PENELOPE**



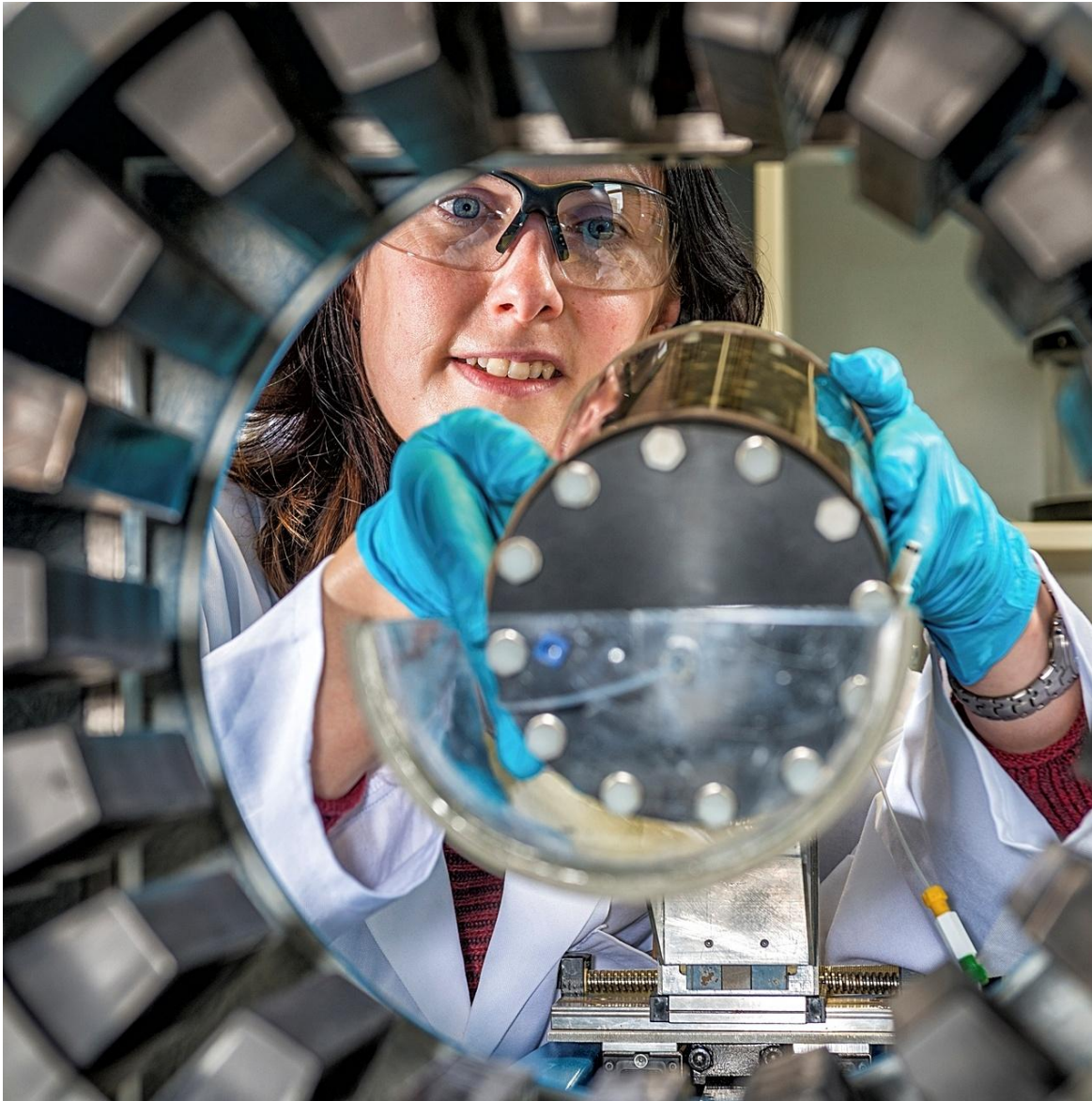


# Research Field Health

## Radiation based Cancer Research

- **Radiopharmacy** and **nuclear medicine**
- Development of **new imaging and radiotherapy methods** as an interdisciplinary task
- Strengthening **translational research** with hospitals
- **Digital health** incl. **big data analytics** and socio-economic effects





# Research Field Energy

Resources & energy

- **Resource** and **energy efficiency**
- Multi-method approach to **sustainable circular economy**
- Development of **multi-phase computational fluid dynamic** tools
- **Process intensification**
- Radioecology for **nuclear waste disposal** and radiochemistry
- Maintenance expertise in **reactor safety**





# Research Field Matter

## Extreme conditions

- Matter under **extreme conditions**
  - High magnetic fields
  - Intense laser pulses
  - Strong fields, e.g. terahertz range
- **High energy density** including laser fusion
- **Quantum-controlled properties** of matter
- Development of **new accelerator concepts and facilities**
- Operation of **user facilities** (~ 1,200 users)



# Transfer & Innovation



**60 M€ SPRIN-D funding**  
**„TECHIFAB“**

## Saxon Transfer Prize

- Ioflupane ( $^{123}\text{I}$ ) ROTOP
- Marketing authorization since 2021
- 2024: > 5.000 produced patient doses

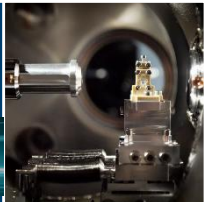


**Helmholtz Innovation Lab**  
**„FlexiSens“**

## Hi-Acts

- Funding period: 2023-2025
- HZDR funding: 4.5 M€

**Hi ACTS**



**World market leader in ion implantation**

- 500,000 wafers/year
- 8 M€ turnover/year

## Strategic Alliances

*Amplitude, Magnotherm, Research Instruments, ...*



# A place to Be – Defining values together

**HZDR-LEITBILD**  
HZDR GUIDING PRINCIPLES

**HZDR**  
HELMHOLTZ ZENTRUM  
DRESDEN-ROSSENDORF

## ATTRAKTIVSTE ARBEITGEBER

Helmholtz Zentrum Dresden-Rossendorf  
- Working for the future



Helmholtz-Zentrum Dresden-Rossendorf (HZDR) | [www.hzdr.de](http://www.hzdr.de) | [info@hzdr.de](mailto:info@hzdr.de)

## #2025 HAPPY CITY INDEX

**17. NEW YORK, NY**  
United States



**18. DRESDEN**  
Germany



**19. BRUSSELS**  
Belgium



**20. GENEVA**  
Switzerland





# Welcome at HZDR!





# Georgian-German Science Bridge

## Key Facts



### Mission

**Scientific & technological cooperation** between **Georgian universities** (TSU, GTU, KIU) and **German Helmholtz Centres** (FZJ, GSI, HZDR) + RWTH Aachen



### Focus

- i. **Education:** exchanges, lectures, internships
- ii. **Research:** Joint MSc/Phd projects
- iii. **Knowledge Transfer:** return programs & SMART|Labs

### SMART|Labs

EDM\_Lab (2016)    AtmoSim\_Lab (2017)  
Digital\_Lab (2023)    Biomedical Imaging Lab (2023)



### Impact

**70+** internships, **17** PhDs, **20+** MSc theses, **new labs & research programs** in Georgia



### Outcome

**Stronger Georgian science base | Long-term partnerships | Mutual benefits**



# Georgian-German Science Bridge

Connecting People and Knowledge

**Science leads the way**

- Science-based solutions
- Guidance for policy makers
- Promoting talents and values
- Building bridges between people & countries



# STRATEGIE 2030+

**HZDR**  
HELMHOLTZ ZENTRUM  
DRESDEN ROSENDORF

“IT’S A  
LONG WAY  
TO THE TOP  
IF YOU  
WANNA  
ROCK’N’  
ROLL.”

AC/DC

**AC/DC**  
PWR UP  
TOUR



Moving Research  
to the **NEXT** Level  
for the **NEXT** Gens

**HZDR**