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# The DESY-Saxony Cooperation

## Original Idea, Current State, Expectations, Next Steps

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# Education and Research in Saxony



**2 Senckenberg Institutes**  
Dresden, Görlitz

## 4 Universities

- TU Chemnitz
- TU Dresden
- TU Bergakademie Freiberg
- University Leipzig

## 7 Max Planck Institutes

CPFS, PKS, MIS  
CBG, EVA, CBS, CSBD

## 7 Helmholtz Centres

HZDR, HIF, UFZ  
HI-MAG, CASUS, DKFZ, NCT

## 8 Leibniz Institutes

IFW, IOM, IPF  
GWZO, DI, IfL, IÖR, TROPOS

## 5 Universities of Applied Sciences

- HTW Dresden
- HTWK Leipzig
- FH Mittweida
- FH Zittau/Görlitz
- FH Zwickau

## 14 Fraunhofer Institutes

IKTS, IWS, IFAM, FEP, IPMS,  
ENAS, IWU, THM  
EAS/IIS, IVI, IVV, ASSID/IZM,  
IMW, IZI

# Main Research Topics

**Chemistry**

**Physics**

**Materials Science**

**Biotechnology**

**Mechanical Engineering**

**Neuroscience**

**Medical Engineering**

**Environmental Research**

Microelectronics

Nanotechnology

Thin Film Technology

Photovoltaics

Batteries

Metal-organic frameworks

Shape memory & high entropy alloys

Lightweight materials

Environmental Technologies

Raw Materials

# Cross-site Topics

Understanding the physical and chemical mechanisms in matters  
using *in situ* and *in operando* synchrotron experiments  
for **holistic materials design**

## New materials for

Energy harvesting and storage

Microelectronics and optoelectronics

Lightweight construction

High-temperature applications and  
extreme conditions

## Processes

Synthesis (incl. crystal/thin film growth,  
HT/HP processes)

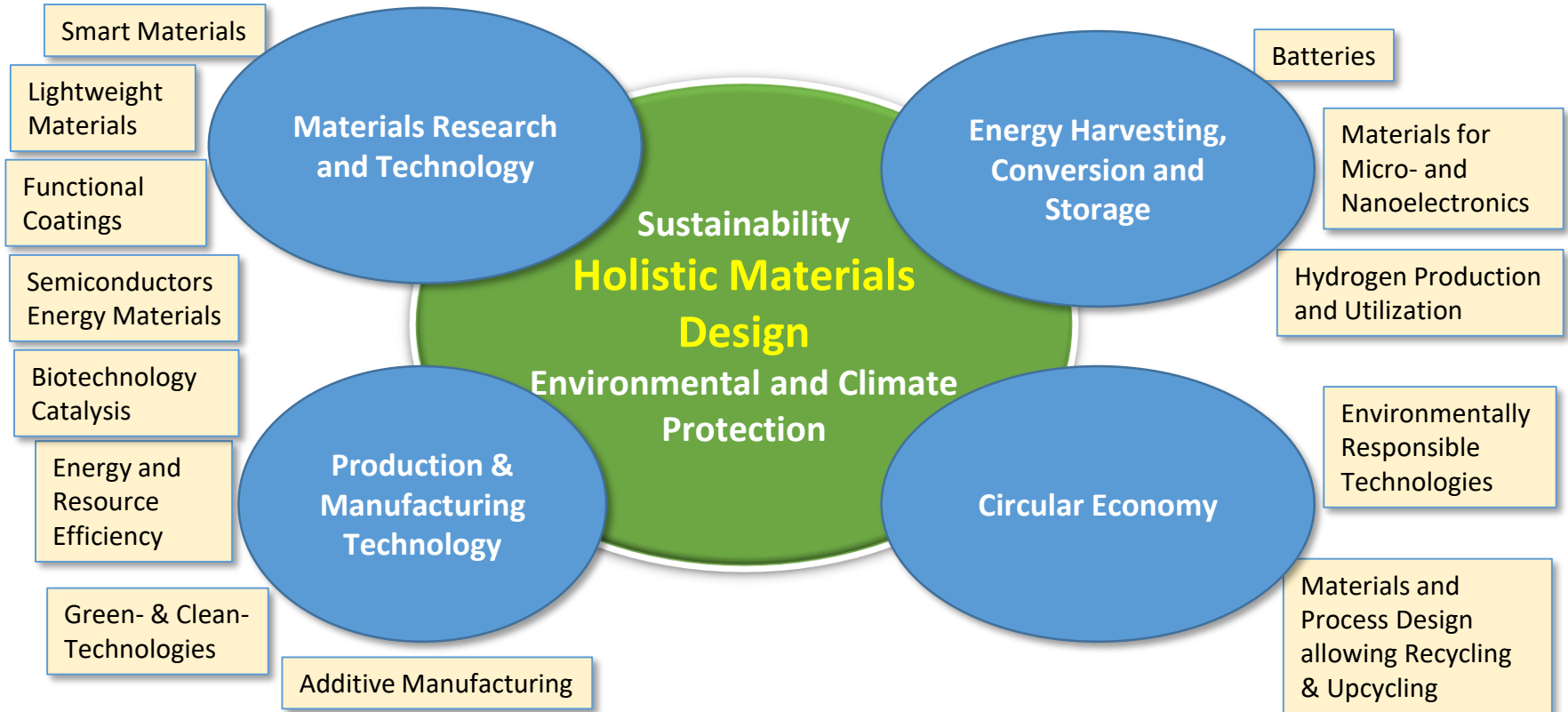
Functionalization (incl. thermal and  
thermomechanical processes)

Production (incl. additive manufacturing)

Behaviour during application

## Recycling & upcycling

# Research Topics

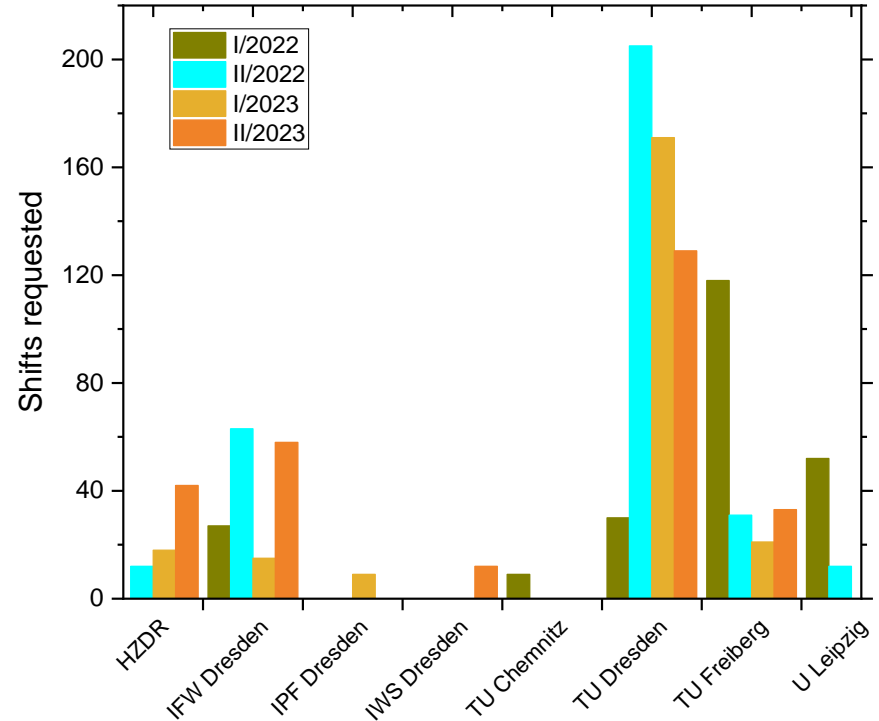
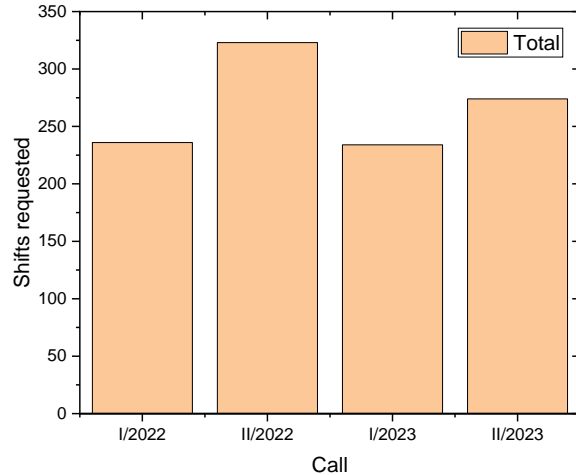


# Need for Synchrotron Experiments

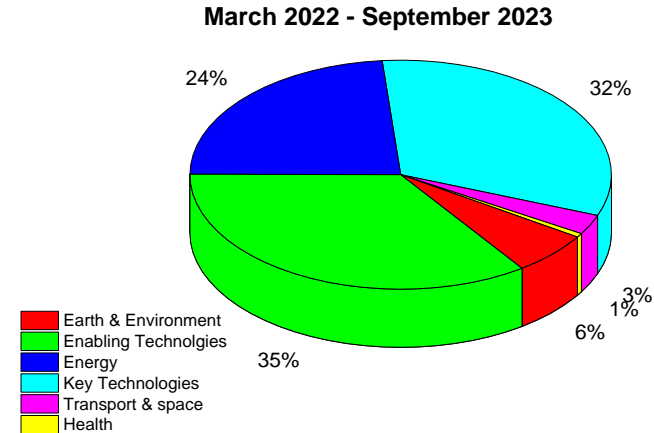
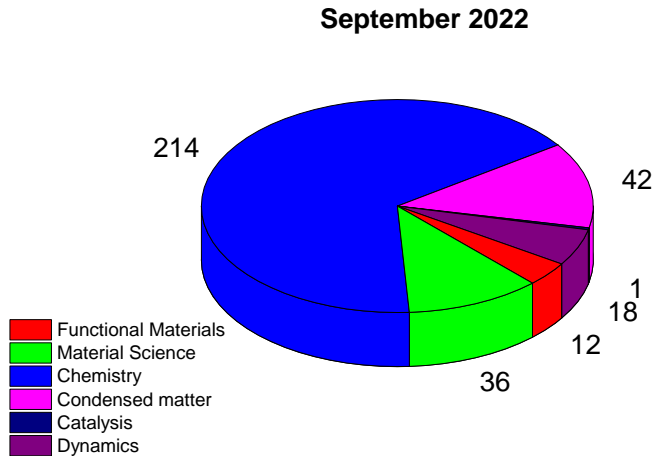
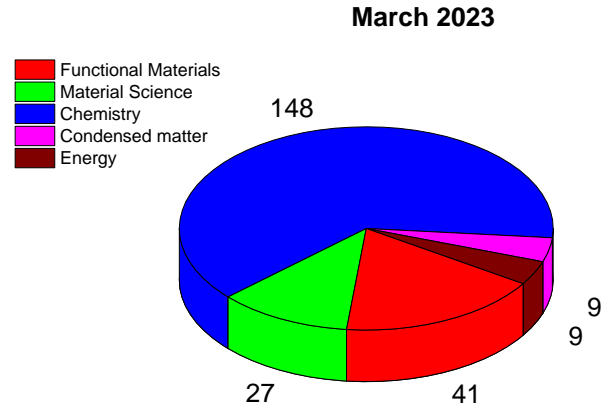
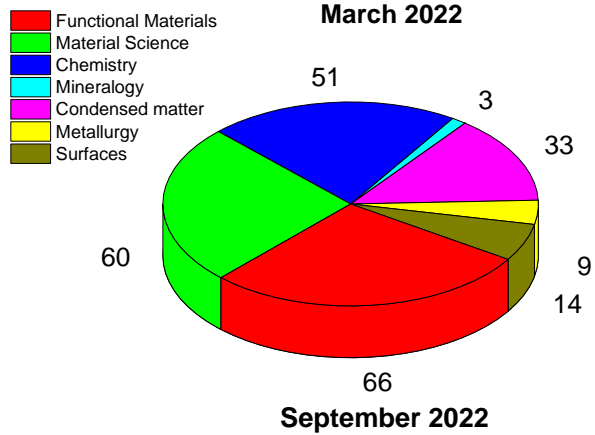
Approximately 30 research groups from Saxony are active at PETRA III/DESY.

Shifts requested  $\approx 280$  per call

Beamtime requested  $\approx 2240$  h/call



# Fields of Research (requested shifts)



# Priority Access – Swedish Model

For users from Saxony, priority access of **1400 h per year** is planned (vs. 2240 h/a requested). The first **700 h were reserved** for the run period **2022-II** (16.08.2022 – 18.12.2022).

## Applicable beamlines:

- Users from Saxony can apply for **all PETRA III beamlines** (for P12, P13 and P14 via the EMBL web page).

## Beamtime

- is awarded **by excellence and/or by priority**.

## Access by excellence

- is **possible for all beamlines**, independent of the availability of the priority access.

## Access by priority

- is only possible for the beamlines owned by DESY. For beamlines not fully owned by DESY, the allotment of the prioritized beam time may be smaller.



# Priority Access

## DESY contingents

P01 : 50 %	P04 : 100 %	P09 : 100 %	P21.2 : 30 %	P61 : 50 %
P02.1 : 100 %	P06 : 100 %	P10 : 100 %	P22 : 100 %	P62 : 100 %
P02.2 : 100 %	P07 : 30 %	P11 : 80 %	P23 : 67 %	P64 : 100 %
P03 : 67 %	P08 : 100 %	P21.1 : 50 %	P24 : 90 %	P65 : 100 %
				P66 : 100 %

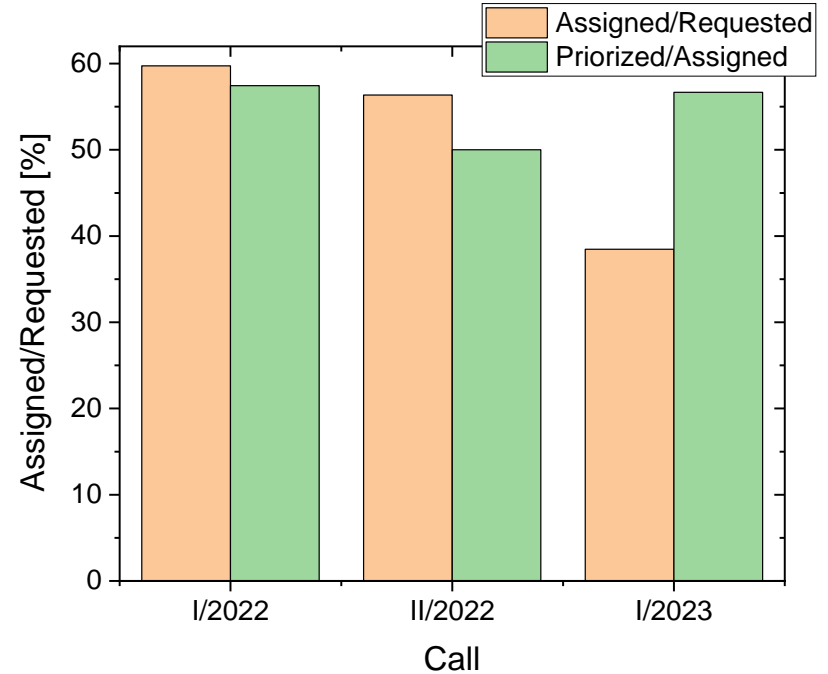
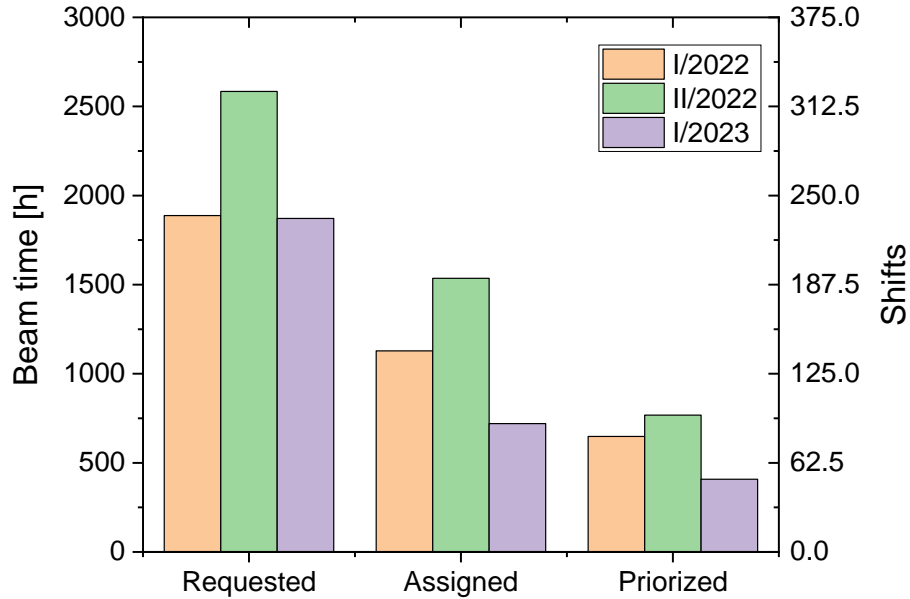
At each beamline, the **sum of all priority beam times** from all partners is **max. 20 %** of the available beam time.

## Aim of the Priority Access

**Currently:** to increase the chances of the users from Saxony to obtain the beam time

**In the future:** to be defined by the Steering Committee and by the Scientific Board, e.g., support of joint and/or coordinated projects, strengthening of cooperation

# Shifts and beam times – all Saxony users

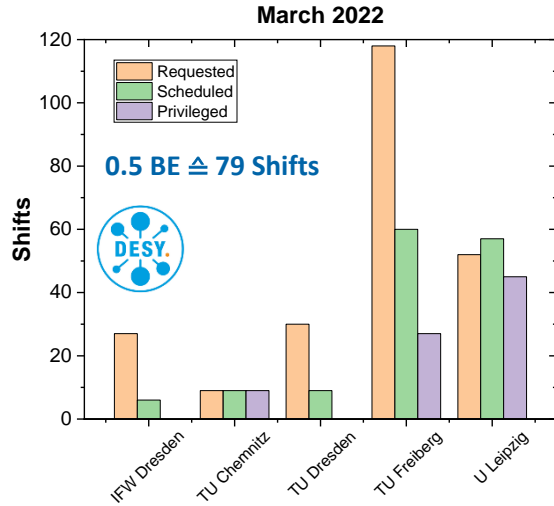


## In the three last calls

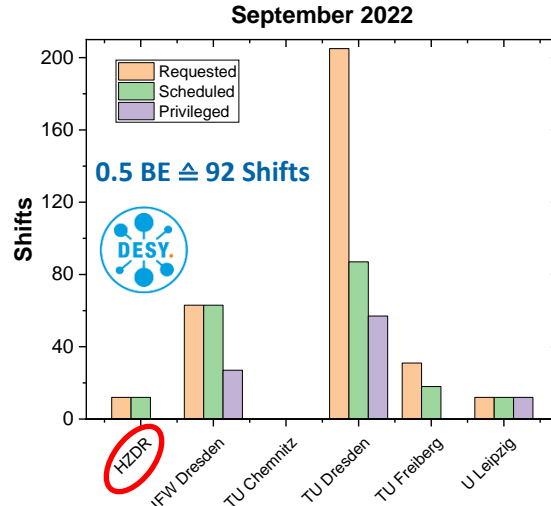
The 'success rate' of the Saxony proposals was between 40 % and 60 %.

Between 50 % and 60 % of the assigned beam time was prioritized.

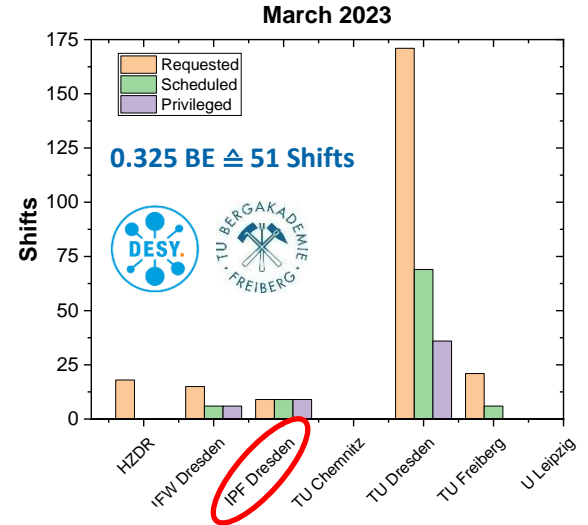
# Proposals and allocated beam time



**Total shifts**  
 Requested: 236  
 Allocated: 141  
 Regular: 48  
 Privileged: 81  
 HEREON (regular): 12

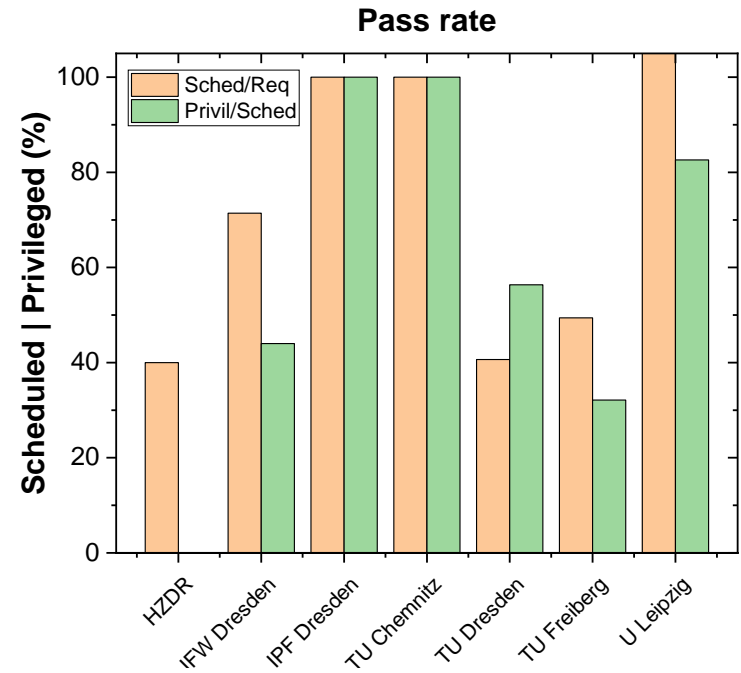
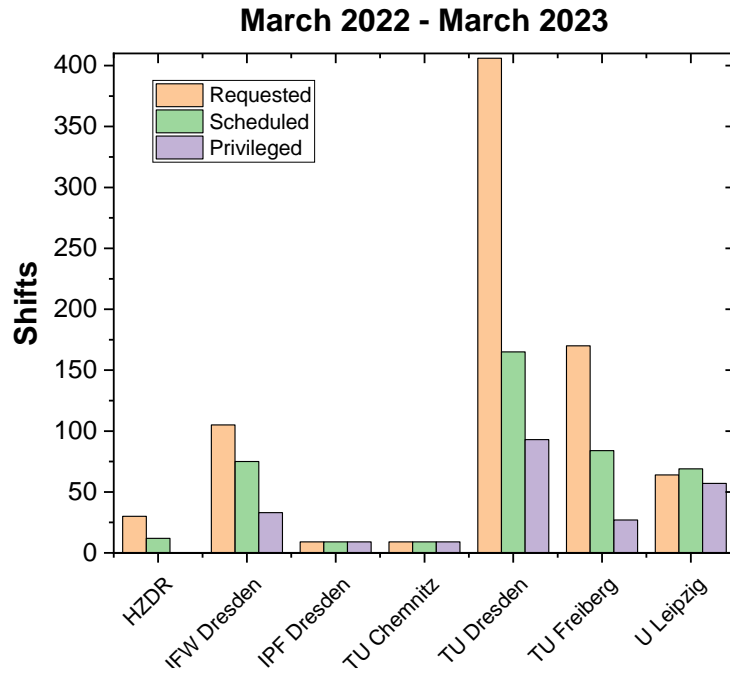


**Total shifts**  
 Requested: 323  
 Allocated: 192  
 Regular: 90  
 Privileged: 96  
 HEREON (regular): 6



**Total shifts**  
 Requested: 234  
 Allocated: 90  
 Regular: 33  
 Privileged: 51  
 HEREON (regular): 6

# Proposals and allocated beam time





# Initial funding

Via DESY (I/2022 and II/2022)



## Sustainability-driven Nano- and Materials Science and Technology with Synchrotron Radiation

Physics, chemistry, materials science and geosciences

### Goals

- To implement and to enable research projects of common interest at all beamlines of PETRA III
- To organize other common activities, e.g., joint workshops and summer schools
- To educate young scientists and train them in the most modern experimental techniques

August 2023 to July 2025 – 0.325 BE



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# Long-term access – new business

## Saxony-DESY Collaboration Centre

STAATSMINISTERIUM  
FÜR WISSENSCHAFT  
KULTUR UND TOURISMUS



Freistaat  
SACHSEN



The concept paper “**Sächsisches Zentrum für nachhaltigkeitsorientierte Materialforschung und Prozessentwicklung**” circulated among the university sites.



# Thanks to ...

## **TU Chemnitz**

Prof. A. Undisz, Electron Microscopy and Microstructure Analytics

## **TU Freiberg / IFW Dresden**

Prof. J. Hufenbach (IFW Dresden), Development and Functionalization of  
Metallic Materials

## **TU Dresden**

Dr. V. Bon, Inorganic Chemistry I

Prof. T. Doert, Inorganic Chemistry II

Prof. J. Geck, Solid State and Materials Physics

## **University Leipzig**

Prof. R. Denecke (Wilhelm Ostwald Institute)

Prof. H. Kohlmann (Inorganic Chemistry)

## **HTW Dresden**

Prof. M. Zschornak, Technical Physics

## **DESY**

Prof. E. Weckert

Dr. K. Ehret

Dr. O. Seeck

## **TU Freiberg**

Dr. J. Grigoleit

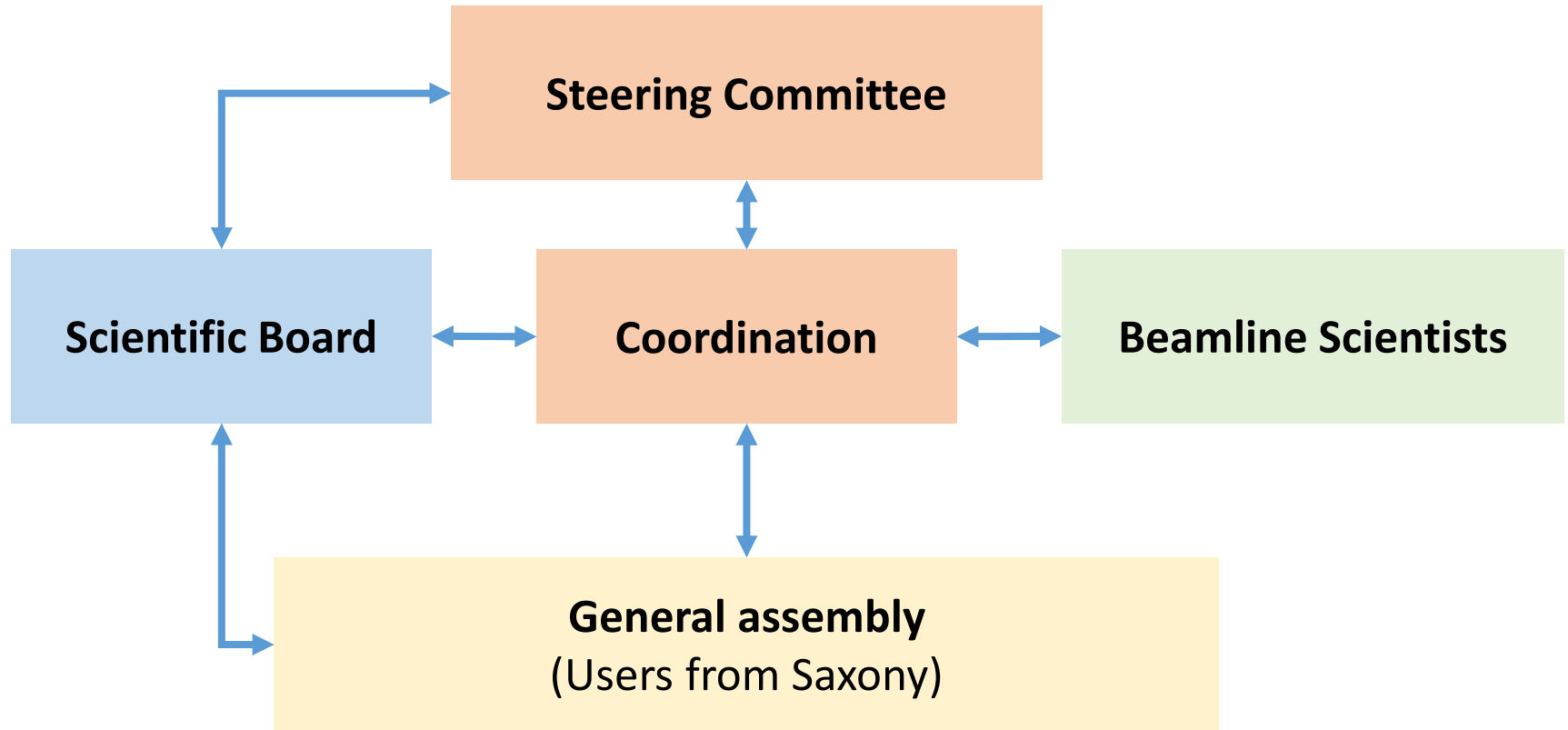


# Tasks of the Collaboration Centre

- Support of scientists from Saxony to get the access to the DESY infrastructure, mainly to the PETRA III and PETRA IV beamlines
- Promotion of the cooperation between universities and research institutes in Saxony and DESY in the fields of materials research and development of new technologies
- Initiation of joint projects
- Utilization of complementary expertise, transfer of knowledge
- Coordination of development and usage of new sample environments for in situ and operando experiments



# Saxony-DESY Collaboration Centre





# Tasks of the Committees (suggestions)

## General assembly

- Presentation of the research topics and joint projects
- Professional exchange, promotion of the cooperation within the Centre
- Suggestions and recommendations for
  - Priority criteria
  - Development of the infrastructure of the Centre, e.g., new sample environments and devices
  - Joint projects
- **Definition of the tasks**
- **Election of members of the Scientific Board**



# Tasks of the Committees (suggestions)

## Scientific Board

- Elected by the General Assembly
- Representatives of the users (at individual locations)
- Responsible for communication with the Steering Committee and with the managements of the involved institutions
- Implementation of the ideas and suggestions of the General Assembly
- Formulation of the priority criteria, strategic plans, further development of the Centre, etc.
- Reports to the General Assembly and Steering Committee



# Tasks of the Committees (suggestions)

## Steering Committee

- Representatives of the Saxon Ministry of Science, Culture and Tourism, DESY and research institutions (universities)
- Harmonization of the priority criteria, strategic plans, further development of the Centre, etc. with the Scientific Board
- Reports to the Saxon Ministry of Science, Culture and Tourism, DESY and research institutions

# Tasks of the Coordination Office

- Responsibility for the information flow
- Maintenance of the website of the Centre (currently at <https://tu-freiberg.de/forschung/sachsen-desy-kooperationszentrum>)
- Announcement of the statistical results of the proposal calls
- Dissemination of the minutes of the meetings
- Planning and organization of the user meetings (general assemblies)
- Communication with the Beamline Scientists (feasibility of the sample environments etc.)
- Coordination of the use / availability of the mobile sample environments
- PR activities, feedback from users
- Announcement of the project calls (BMBF, SMWK)



# Current activities

Discussion and harmonization of the concept paper

**“Sächsisches Zentrum für nachhaltigkeitsorientierte  
Materialforschung und Prozessentwicklung”**

at the Meeting of the Rectors of the Saxony Universities  
(including the Universities of Applied Sciences) in frame of the  
meeting of the “Landesrektorenkonferenz”

prior to the submission of the concept paper at the Ministry (SMWK)



# To-do list

## General assembly

- Comments to the concept paper
- Definition of the own tasks
- Suggestion and election of members of the Scientific Board