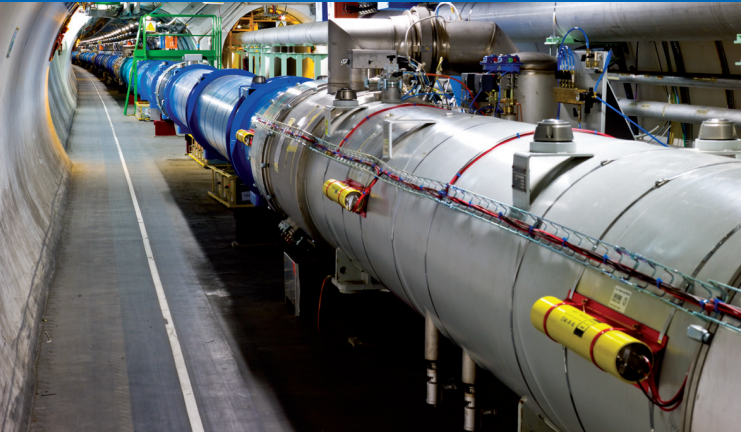


# Karrierestart am CERN



Wolfgang-Gentner-Stipendium  
Deutsches Technisches Doktoranden-  
programm am CERN

## My experience as a student of the Wolfgang Gentner Programme

**Bastian Härer**

11/2013-10/2016

23<sup>rd</sup> Gentner Day — 26 April 2023

# Who am I?

Accelerator physicist



Karlsruhe Institute of Technology  
in Karlsruhe, Germany

- Lattice design and transverse beam dynamics
- Teaching (KIT, JUAS)
- Supervising students
- Elected member of the "Komitee für Beschleunigerphysik"





# Where do I come from?

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**SALAMANDER** 



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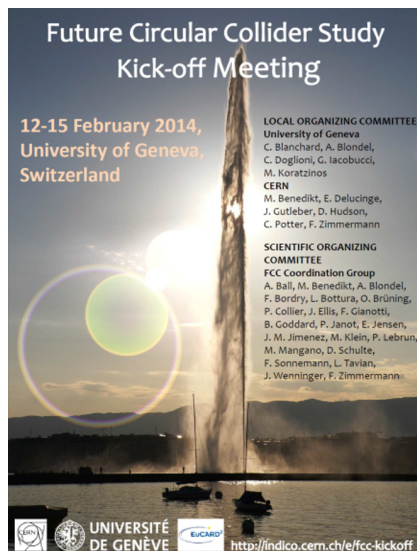


©CERN: CERN-PHOTO-201808-226-7



# My doctoral thesis

*“Lattice design and beam optics calculations for the new large-scale electron-positron collider FCC-ee”*  
(CERN-THESIS-2017-073)



Poster of the FCC Kickoff Meeting

- First lattice design of FCC-ee
- Emittance tuning (four different beam energies)
- First simulations including magnet tapering
- Higher-order chromaticity corrections

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  - Visits — do as many as you can!
- Independent of machines in operation
- I appreciated the drive of the new project
- Plenty of trips: CAS in Prague, Grenoble, Washington DC, ...





# Conferences all over the world!

**55th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e<sup>+</sup>e<sup>-</sup> Colliders – Higgs Factory**

**International Organizing Committee (IOC)**

- Michael Benedick (CERN)
- Marco Baghi (INFN-LNF)
- Ahmed Bostani (U. of Geneva)
- Alex Chao (SLAC)
- Swapnil Chattopadhyay (Cockcroft Inst.)
- Wenbin Chou (Fermilab, Co-Chair)
- Jie Guo (IHEP)
- Stuart Henderson (Fermilab)
- Andrew Hudson (SLAC)
- Eugene Levikoy (BNP)
- Xinshou Liu (IHEP)
- Katsuhiro Oide (KEK)
- Qing Qin (IHEP, Co-Chair)
- Dave Ross (Cornell U.)
- John Seeman (SLAC)
- Chuanzang Tang (Tsinghua U.)
- Jörg Wimmeringer (CERN)
- Frank Zimmermann (CERN)

**Local Organizing Committee (LOC)**

- Huipeng Geng (IHEP)
- Yinghua Jia (IHEP)
- Shuchun Liu (IHEP)
- Qian Pan (IHEP)
- Tongbo Xu (IHEP, Chair)
- Shan Geng (IHEP)
- Ning Zhao (IHEP)

**Topics**

- Parameters
- Optics
- Interaction region and machine-detector interface
- Synchrotron radiation and shielding
- Superconducting RF
- Injectors and injection
- Orbit stability and beam instability
- Polarization
- Instrumentation and control
- \*Green\* Higgs factory

**October 9-12, 2014**  
**Hotel Wanda Realm**  
**Beijing, China**

**HF2014**

<http://hf2014.ihep.ac.cn>  
Email: hf2014@ihep.ac.cn  
Registration Deadline: August 31, 2014





**FCCWEEK 2016**  
**ROME 10-15 APRIL**  
[fccw2016.web.cern.ch](http://fccw2016.web.cern.ch)



**7th International Particle Accelerator Conference**

**May 8 – 13, 2016**  
**BEXCO**  
**Busan, Korea**

**PAL** POHANG ACCELERATOR LABORATORY

**ORGANIZING COMMITTEE CHAIR**  
Won Namkung, PAL

**SCIENTIFIC PROGRAM COMMITTEE CHAIR**  
In Soo Ko, POSTECH

**LOCAL ORGANIZING COMMITTEE CHAIR**  
Kyung-Ryul Kim, PAL

Co-Hosted by **KOMAC** Korea Multi-Purpose Accelerator Complex

**RIKEN** RIKEN INSTITUTE OF PHYSICS AND CHEMISTRY

**RIS** Rare Isotope Science Project






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  - **There are possibilities to talk both inside and outside CERN.**
- Writing your thesis will be an incredibly stressful time: **take proper holiday afterwards to recover!**

# The two persons who inspired me most

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- Developed an interaction region for FCC-ee
- Brilliant physicist and mathematician
- Shared his work with me unconditionally
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## Bernhard Holzer (CERN) — my CERN supervisor

- Empathic person, who cares a lot
- Down to earth and a lot of experience
- Pragmatic solutions, get the job done (quickly)
- *“You need to have interests outside of physics!”*

# Enjoy the region!



# The lake, ...





# the Alps, ...



Hike to Lac Blanc



... and the Jura is right in front of you!





Montreux  
Jazz Festival





# Good food



## Oliver Stein

my former room mate  
former Gentner student  
now working at DESY



# Good food



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CERN wife: Ferney-Voltaire's Marché


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## My reasons:

- It is difficult to rely on a career at CERN.
- High fluctuation of people: difficult to have long-term friendships.
- International bubble: not properly integrated in the region.
- I wanted to be closer to my family again.
- I was not satisfied with my job anymore.

# Our accelerators in Karlsruhe

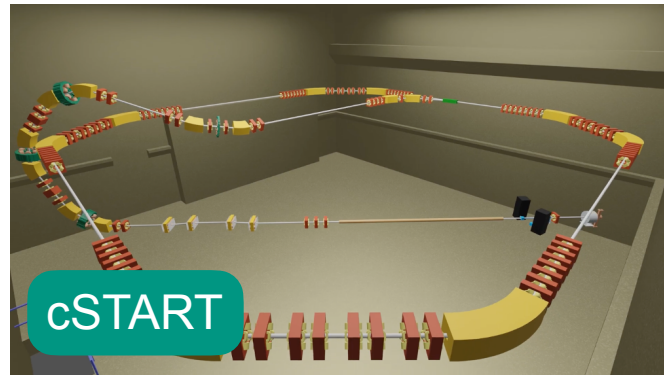


in operation

# Our accelerators in Karlsruhe



in operation



in procurement

# How did my scientific life change in Germany?

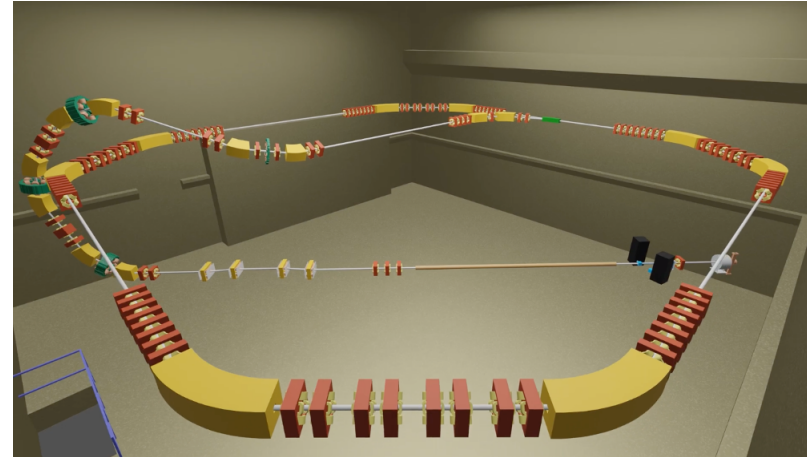
- From very large to very small accelerators
- Focus more on diagnostics development and physics of the micro bunching instability

## **KIT is both a research center and a university**

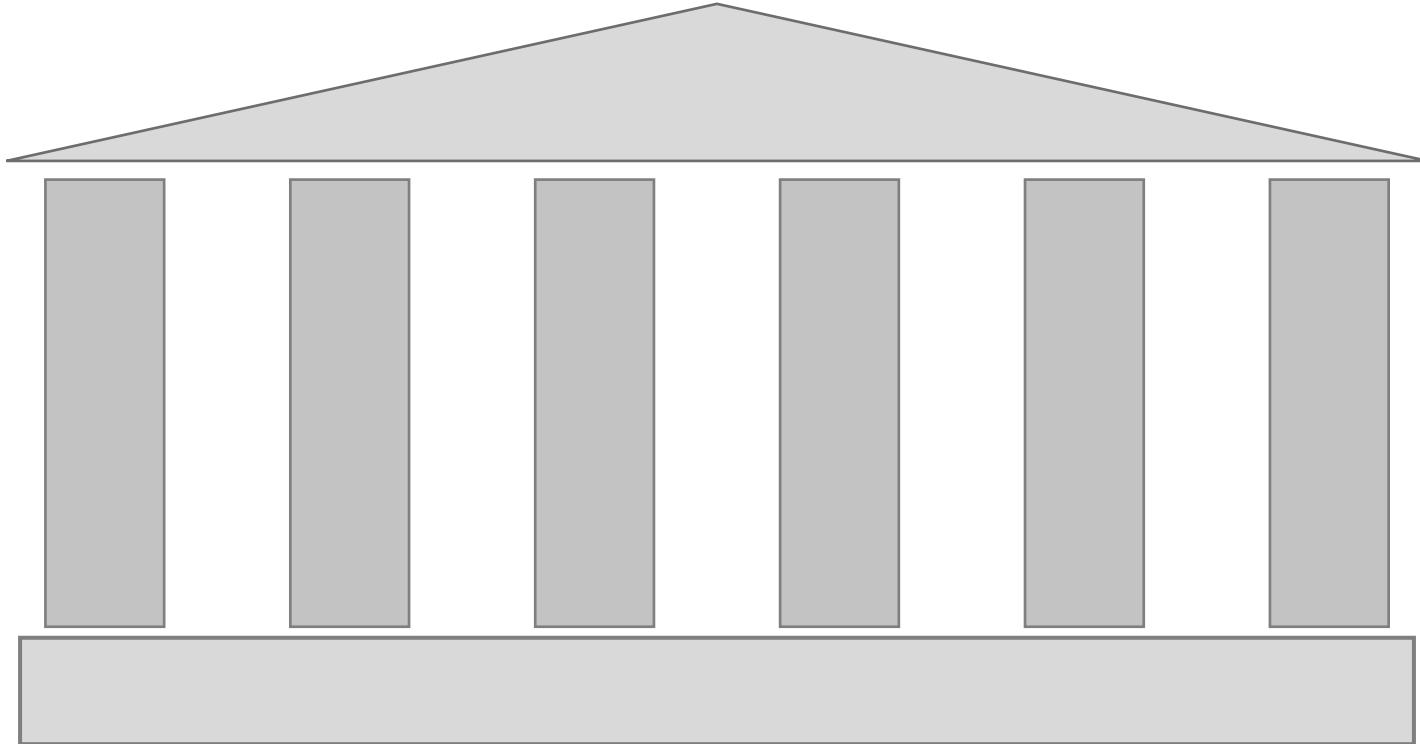
- I immediately supervised two doctoral and one master student
- I got the chance to give lectures

## **Less own research, more research administration**

- I am involved in project proposals and project management
- I started to do committee work
- I had to learn a lot about the German science system



# The German Science System

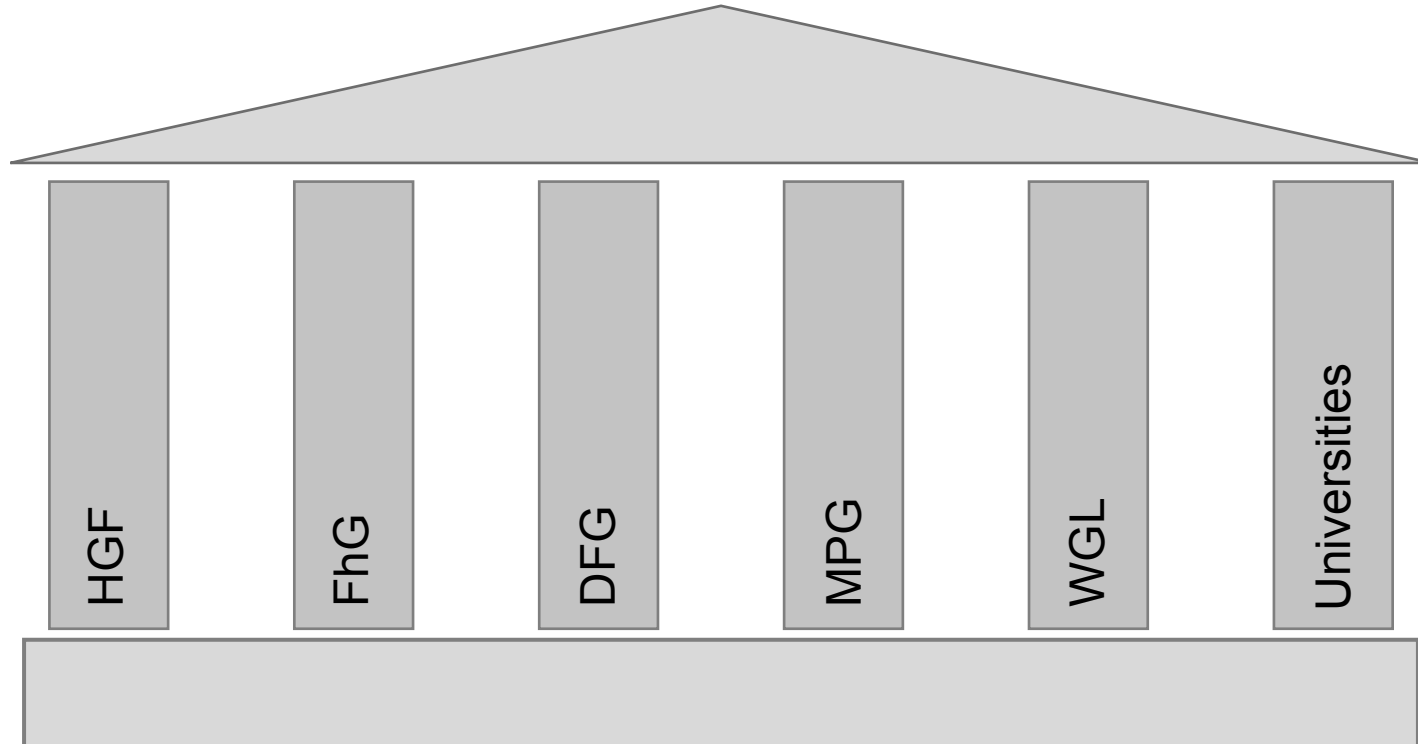




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HGF – Helmholtz Association  
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DFG – German Research Foundation

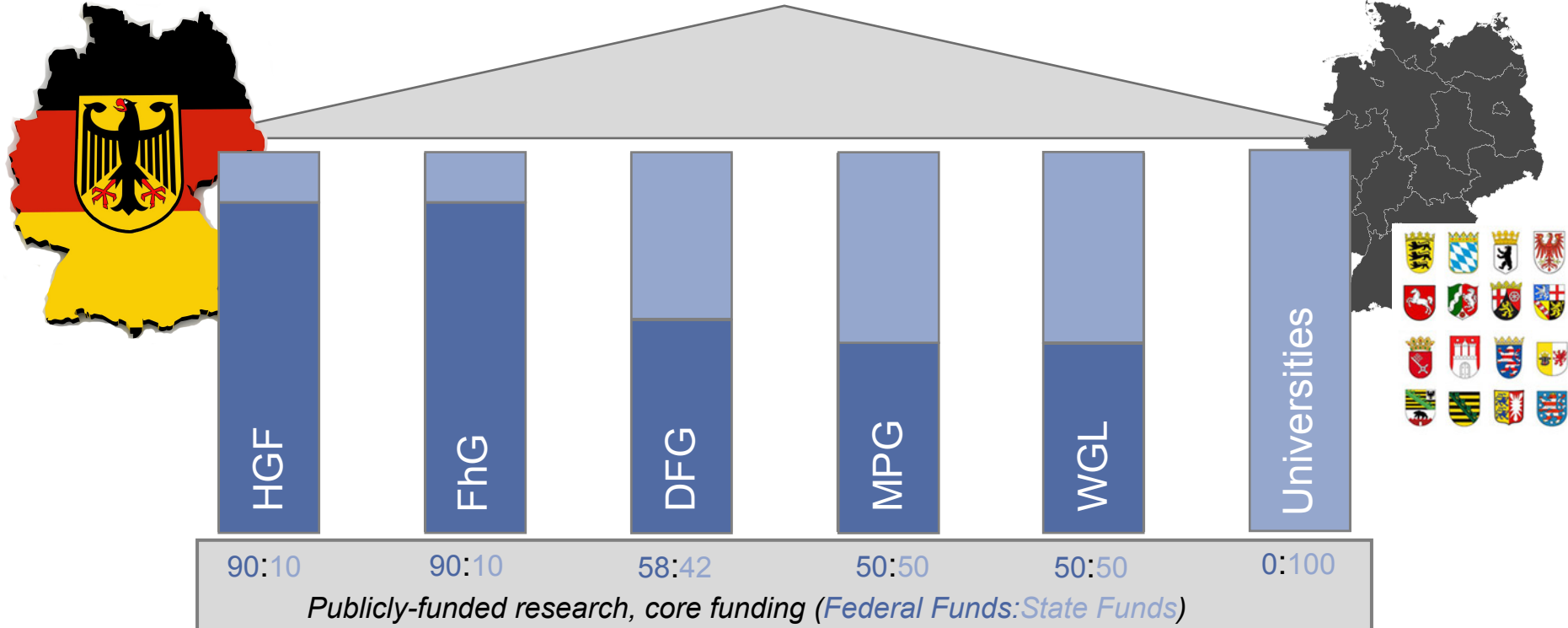
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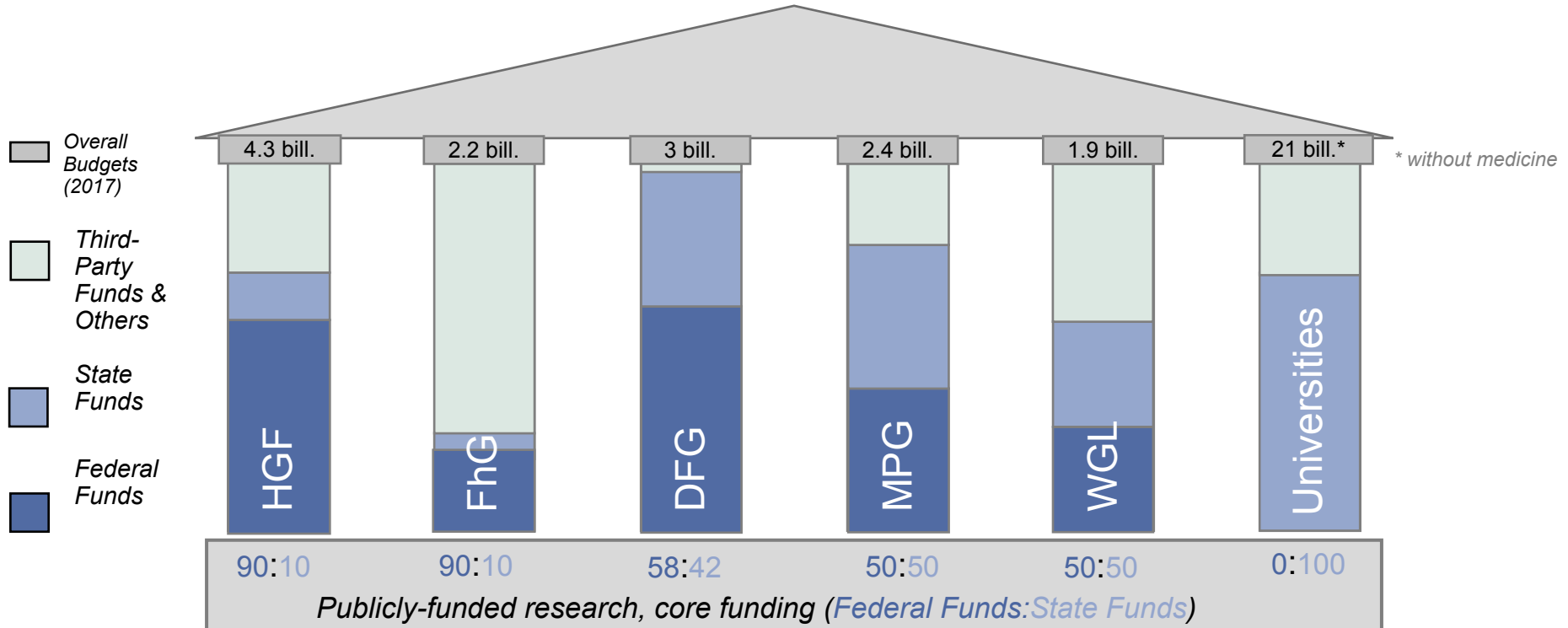
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# The German Science System – Including Third-Party Funds

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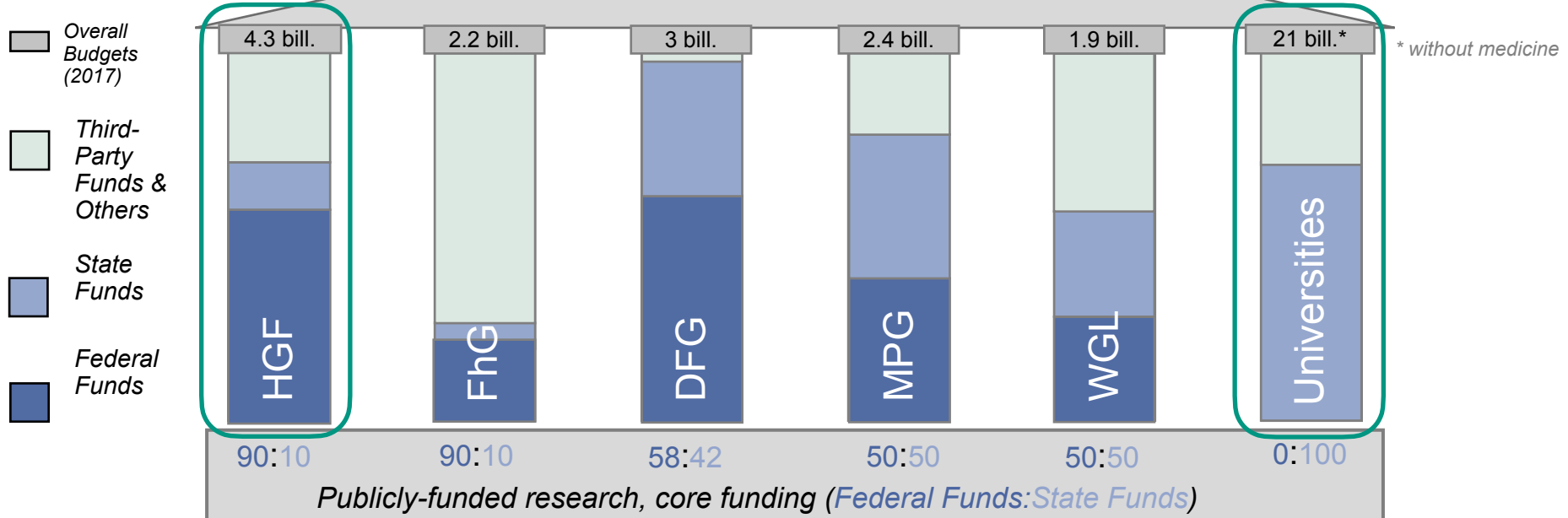


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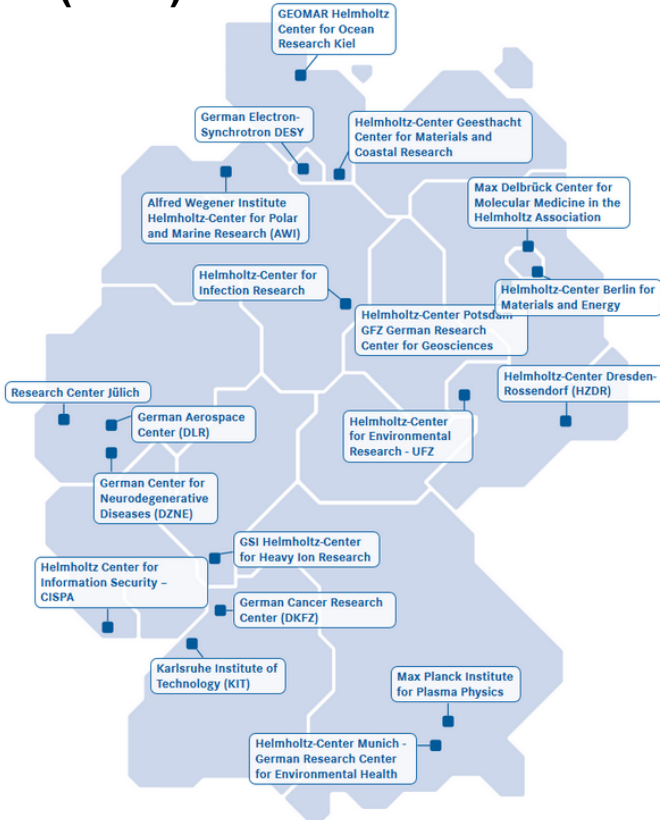
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Accelerator and detector research



# Die Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V. (HGF)



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> 40.000 employees  
annual budget of > € 4.3 billion
- Mission of HGF: address the grand global challenges
- HGF is promoting research in six research fields:

ENERGY

EARTH AND ENVIRONMENT

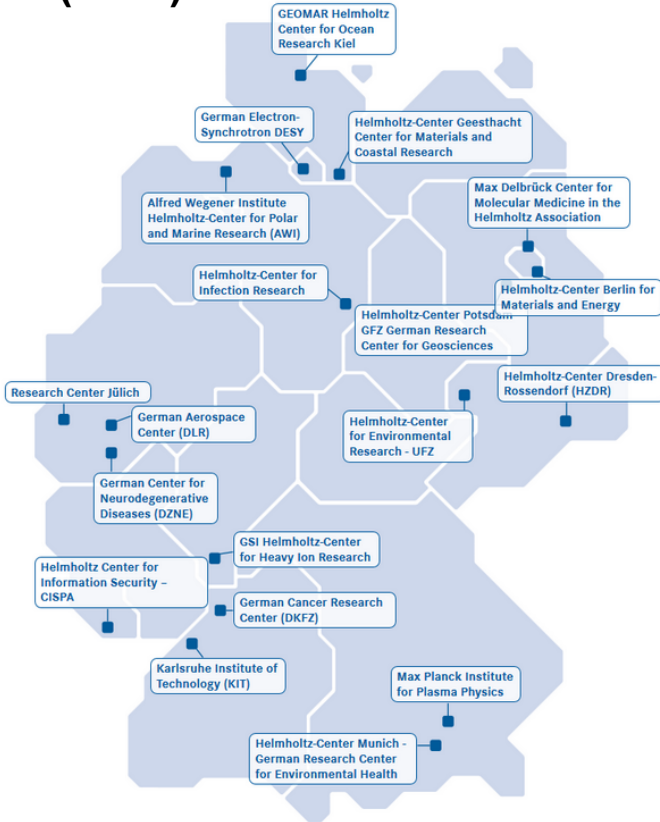
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KEY  
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- Accelerator and detector R&D is in MATTER



# My motivation to stay in science

- Accelerator R&D is a very interesting topic!
- I now have spent 11 years in the field and have built a network
  - Both in Germany and internationally (benefit from time at CERN)
- I love the international collaboration and conferences
- At KIT I like the combination of science and teaching
  - Teaching at Joint Universities Accelerator School (JUAS)
- Real chances to get permanent positions in the Helmholtz Centers

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- If you would like to come back: Keep an eye on the German research landscape (DPG conferences, meetings with colleagues in Germany,...)
- Take care of yourself.
- Enjoy CERN and the region!





Thanks for listening! — Do you have questions?

[bastian.haerer@kit.edu](mailto:bastian.haerer@kit.edu)