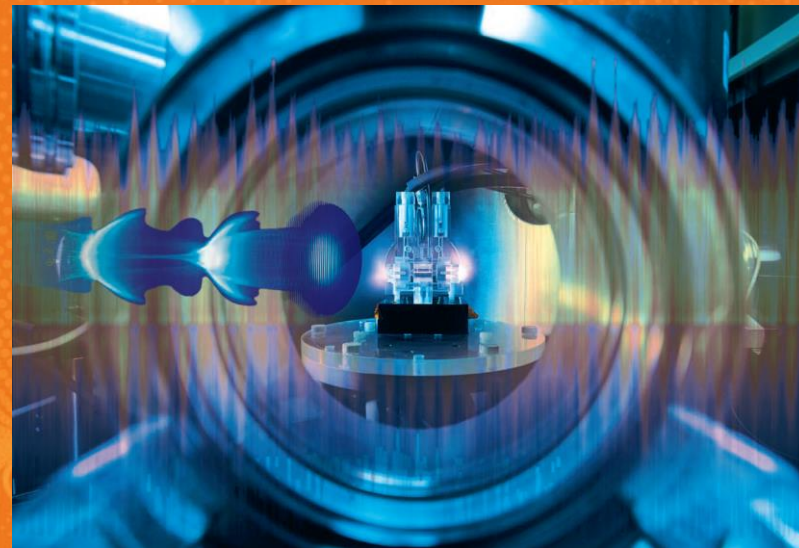
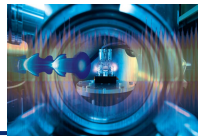


## PROGRAM Matter and Technologies

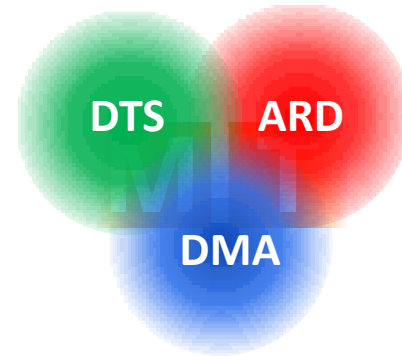
Ties Behnke, Anke-Susanne Müller



# Matter and Technologies



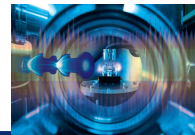
- Research in Matter is bold and broad
- It relies on brains and on advanced technologies
- MT is a trail blazer program into the future of matter



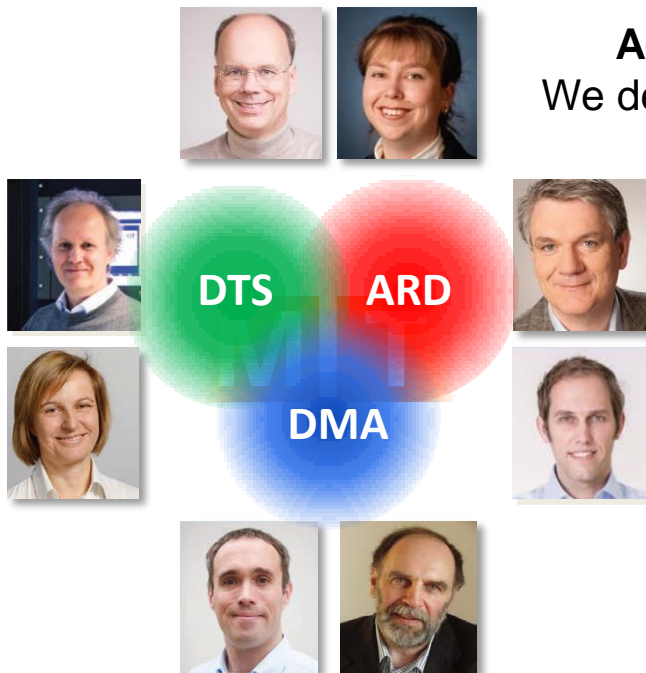
Accelerators  
Detectors  
Data



# We research technology



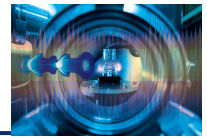
**Detectors** are our eyes  
We pioneer new technologies  
We go from detection to  
detectors



**Accelerators** drive our science  
We develop and engineer the next step  
We go from acceleration to  
accelerators

**Computing** enables understanding  
We are part and drive the digital revolution  
We handle the unimaginable

# The Challenges



## Detectors

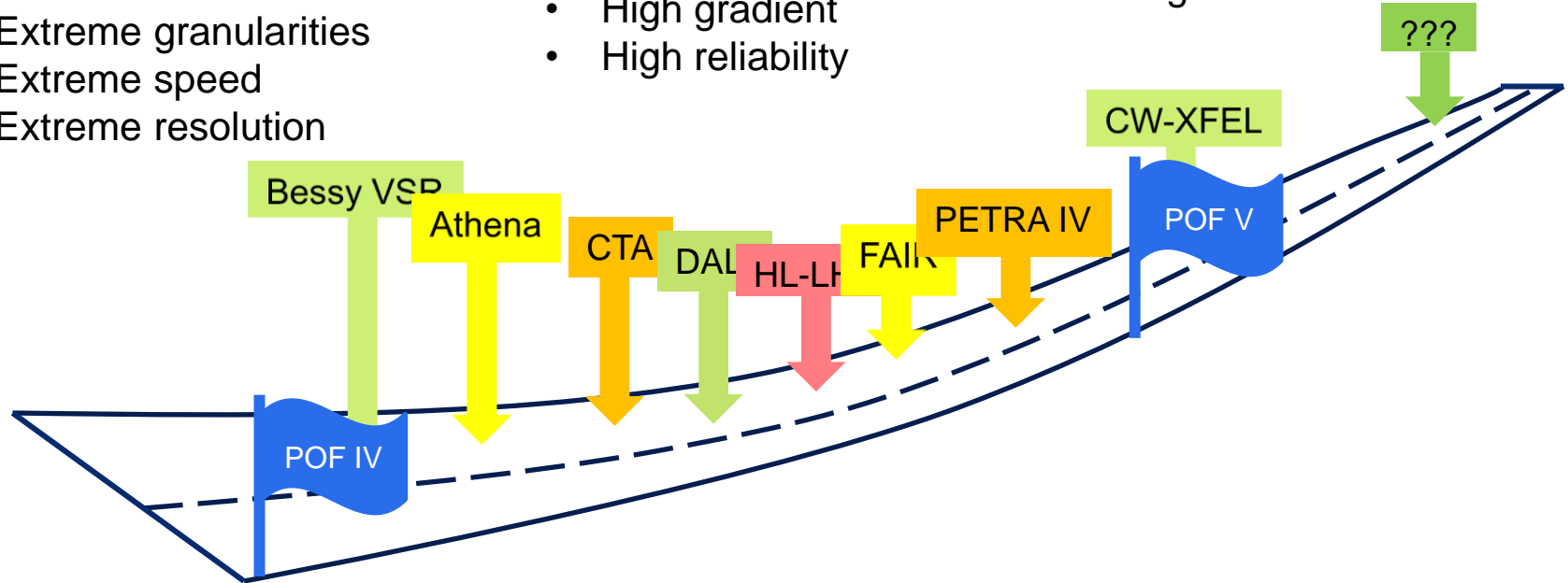
- Extreme granularities
- Extreme speed
- Extreme resolution

## Accelerators

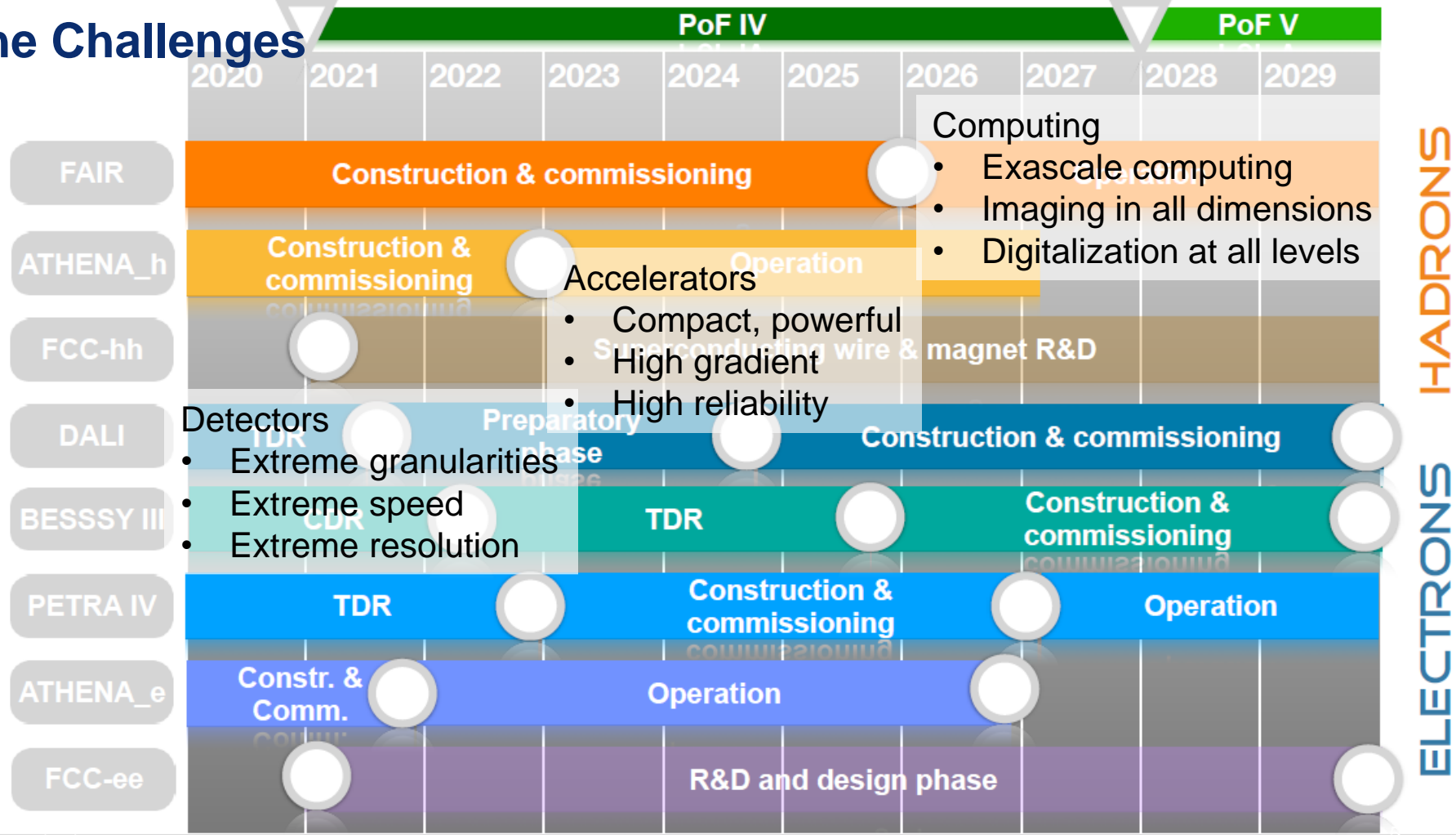
- Compact
- High gradient
- High reliability

## Computing

- Exascale computing
- Imaging in all dimensions
- Digitalization at all levels

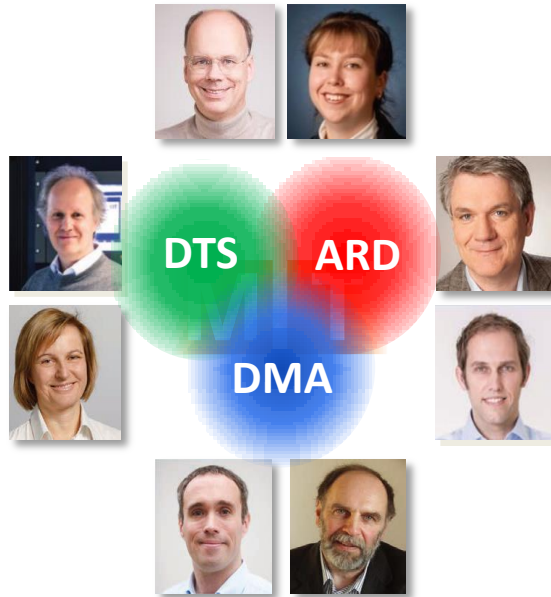
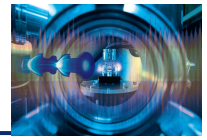


# The Challenges





# The MT Management Challenge

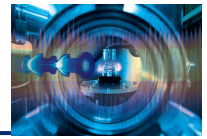


Management structure is working well

- Strategy development
- Cooperation development
- Networking



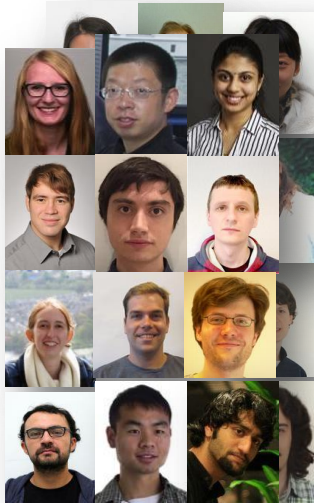
# People matter



Establish research into technologies as a recognized research field  
Make a career in this field attractive

Strong link to  
universities

Create visibility  
and recognition

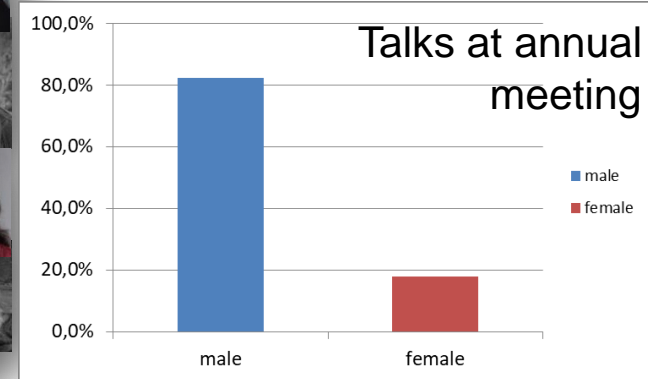
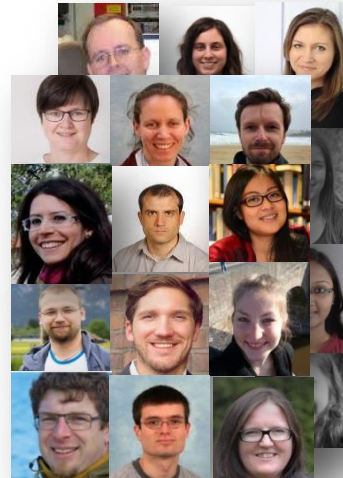


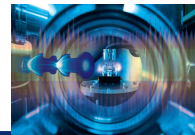
Staff Scientist:  
13% female  
25% int

Postdoc 14% female  
58% int

Phd: 27% female  
44% int

Support: 17% female  
11% int





MT is an active community

- MT annual meeting
  - 300 people, 170 contributions
- Topical meetings
- Working groups

Young people are essential

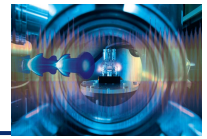
- Annual MT student retreat
- Dedicated schools for students
- Annual meeting as a forum for younger researchers



Student retreat  
at HZB 2018

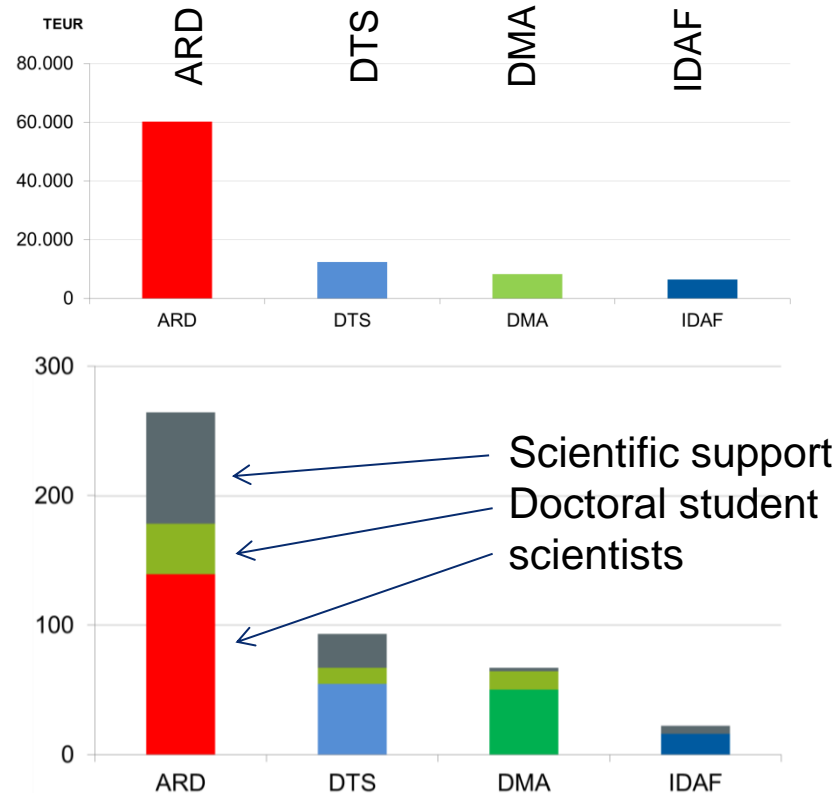


# How do we get there?



Sizeable  
strategic investment  
in people  
and money

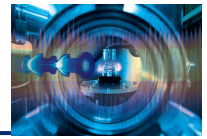
>400 people  
80 Mio EUR



Budget

Personnel

# Innovation and Cooperation



M T ARD

M T DMADTS  
M T

M T DTS



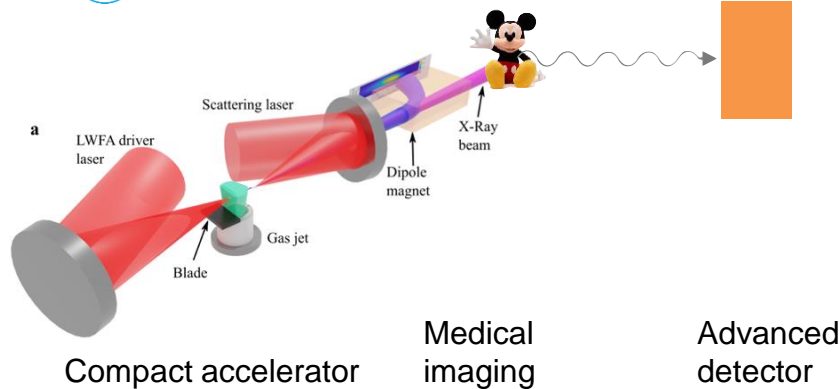
HZDR



HMGU



Karlsruhe Institute of Technology



To the hospital

Plasmed-X

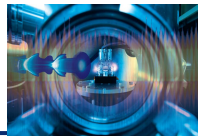
- Multi-center project
- Matter and health
- Universities

Explore possibilities to combine innovative accelerator and detector technology with an innovative imaging technique (X-ray fluorescence of gold nano-particles).



Work supported by the BMBF innovation pool and Matter

# Technology Transfer



A success story:

- $\mu$ TCA electronics standard

Scientific need (XFEL)

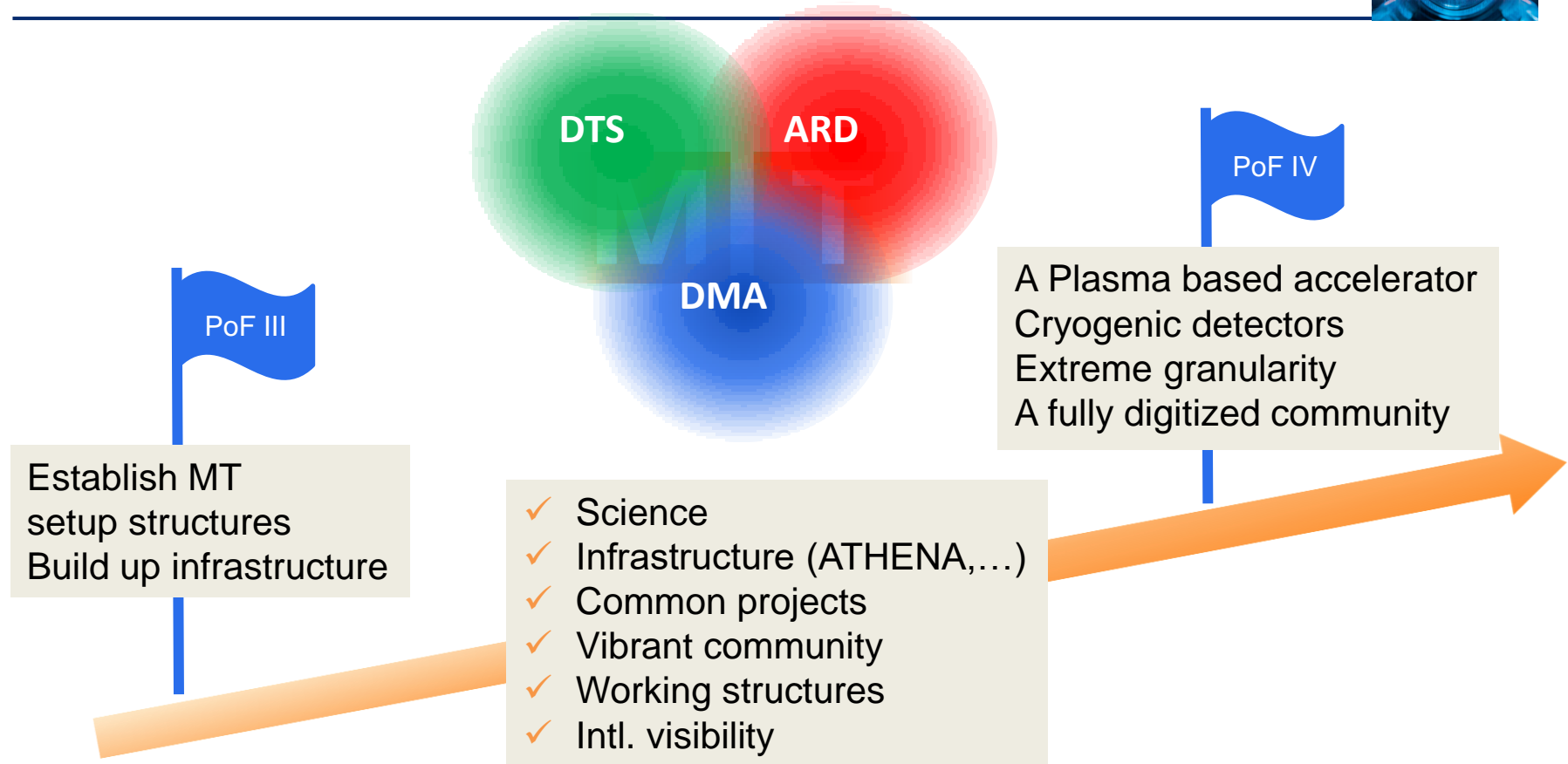
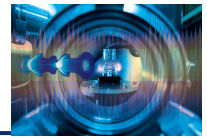
Seed money  
from Helmholtz



A worldwide success  
currently used by 55 laboratories+  
industry



# Our way into the next 7 years

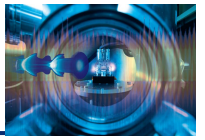




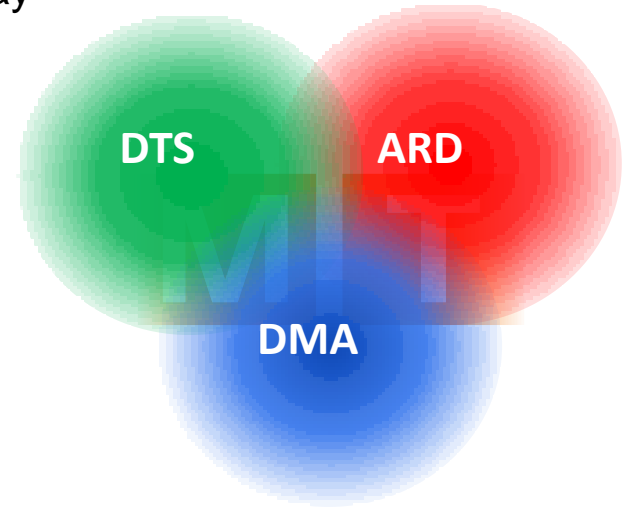
# Additional information

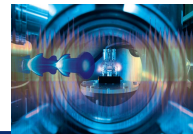
Guiding questions for panel

# Our Vision



- We do cutting edge science in Matter
- Technologies form the basis of our science
- New technologies promise to fundamentally change the way we do science
- Compact accelerators revolutionize our infrastructure
- Amazing detectors open new worlds of details
- Powerful algorithms open new ways to do science
- Matter and Technologies is our vehicle to meet the future





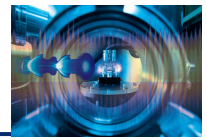
## Tasks of the reviewers

Evaluation of the programs & research topics in terms of **four dimensions**: (i) goals; (ii) work program; (iii) competences and resources; (iv) impact and risks.

- Report with concise statements for each dimension
- Rating in each dimension for topics

Each topic should be assigned to one of three **funding categories** (A,B,C).

The panel **reviews the resources planned for each topic** and makes specific suggestions regarding **potential budgetary and strategic changes** of the research programs and their respective topics.



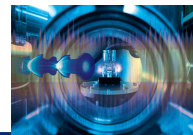
## Guiding Questions: GOALS

- How would you rate the **objectives** of the program/topic with regard to scientific relevance and leadership? Which pressing societal or scientific challenges does it address?
- How would you evaluate its **strategic focus**? Is it innovative and is the approach unique?
- How would you evaluate its **contribution to the Helmholtz mission**, its strategies in transferring knowledge and technologies as well as for the development of talents and careers, including diversity management?
- How would you evaluate its **alignment** with the strategy of the research field?

## Guiding Questions: WORK PROGRAM

- How would you rate the proposed **work plan** with respect to the objectives? How coherent is the research concept/approach on the respective level? Are important aspects missing?
- How are the key competences of the **partners** integrated with regard to complementarity? How do they benefit from **collaboration**?
- How would you evaluate the **organizational structure** and the management? Does it provide tools for ideas, innovation, flexibility and agility?



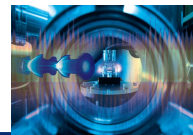


## Guiding Questions: COMPETENCES & RESOURCES

- Based on the scientific evaluation, the program proposal and the oral presentations, how would you rate the overall **scientific quality** of the planned program/topic and the expertise of its scientists with regard to (i) potential for international leadership and groundbreaking research; (ii) competence of the partners; (iii) feasibility of the work program?
- How would you assess the **resources planned for each topic** with respect to the scope of the program/topic?

## Guiding Questions: IMPACT & RISKS

- How would you rate the potential **impact** of the program with regard to the research field, its technologies and its societal context? Does it contain elements serving as a nucleus for establishing new research areas? How would you rate the balance between groundbreaking and long-term research?
- What are major strengths and potential weaknesses?
- What are the opportunities, risks, and showstoppers?



## In Strategic Evaluation:

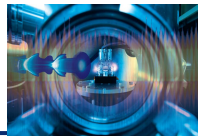
- (inter-)national relevance
- Relevance for the programs and the research field

based on scientific evaluation:

- **Scientific** quality and **strategic** relevance
- Access and service for **users**
- Appropriateness of **resources** used and future costs

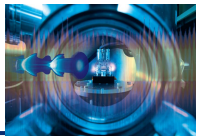
## Key Questions: User Facilities

- How would you rate the **quality** and the **relevance** of the facility on a **national, European or international level** now and (in view of planned / proposed upgrades, if applicable) towards the end of the forthcoming program period?
- What **role** does the facility play for the associated program and the research field in the forthcoming program period?



- YIGs
  - Schemes for postdocs
  - Technical staff training
  - Future strategy for the next 10 yrs
- Should fit to the overall strategy of Matter and Helmholtz
  - From other RF evaluations we already know, that the focus concerning strategy is about 10 years (the what and the how)

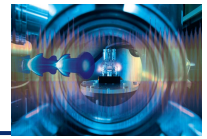
# COOPERATION



- Scientific cooperation with other programs/RFs
- Cooperation with non-Helmholtz partners
- National and international
- Future strategy for the next 10 yrs
- Should fit to the overall strategy of Matter and Helmholtz, even EU
- Possibly mention innovation pool projects
- From other RF evaluations we already know, that the focus concerning strategy is about 10 years (the what and the how)



# USER FACILITIES/LK II/Facility Topics

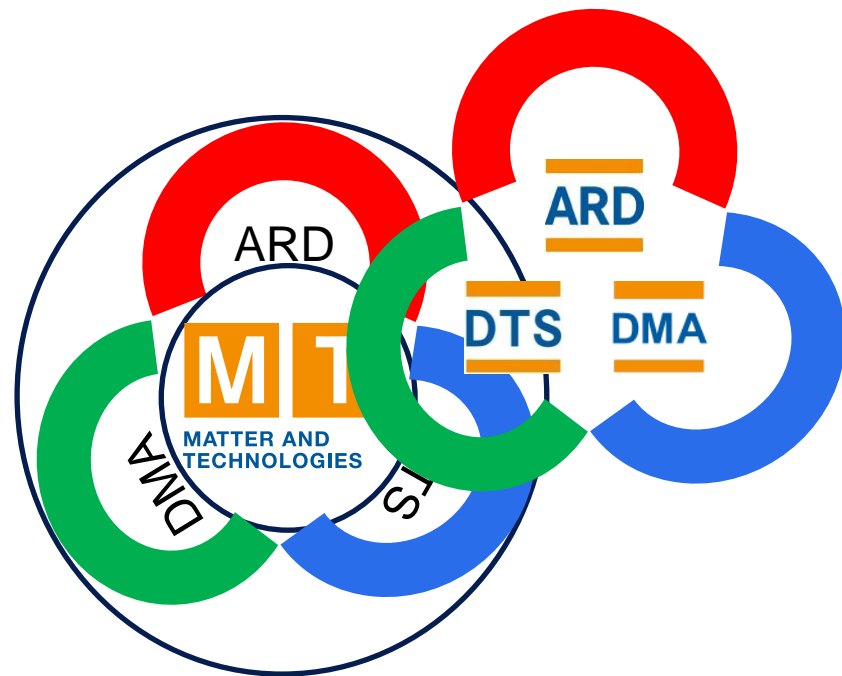
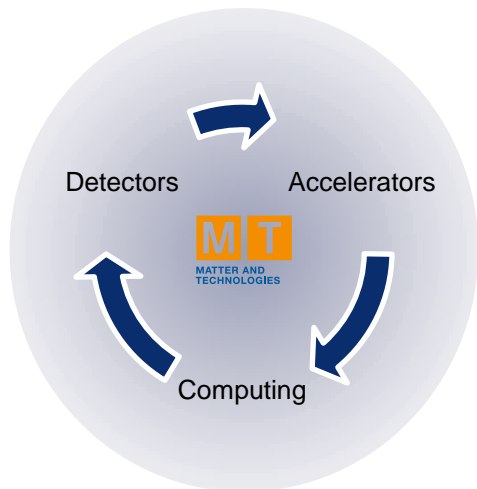
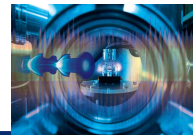


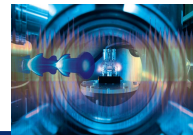
- Existing and future planning
- Resources
- Complementarity of facilities
- Relevance for national and international context/user community
- System competence

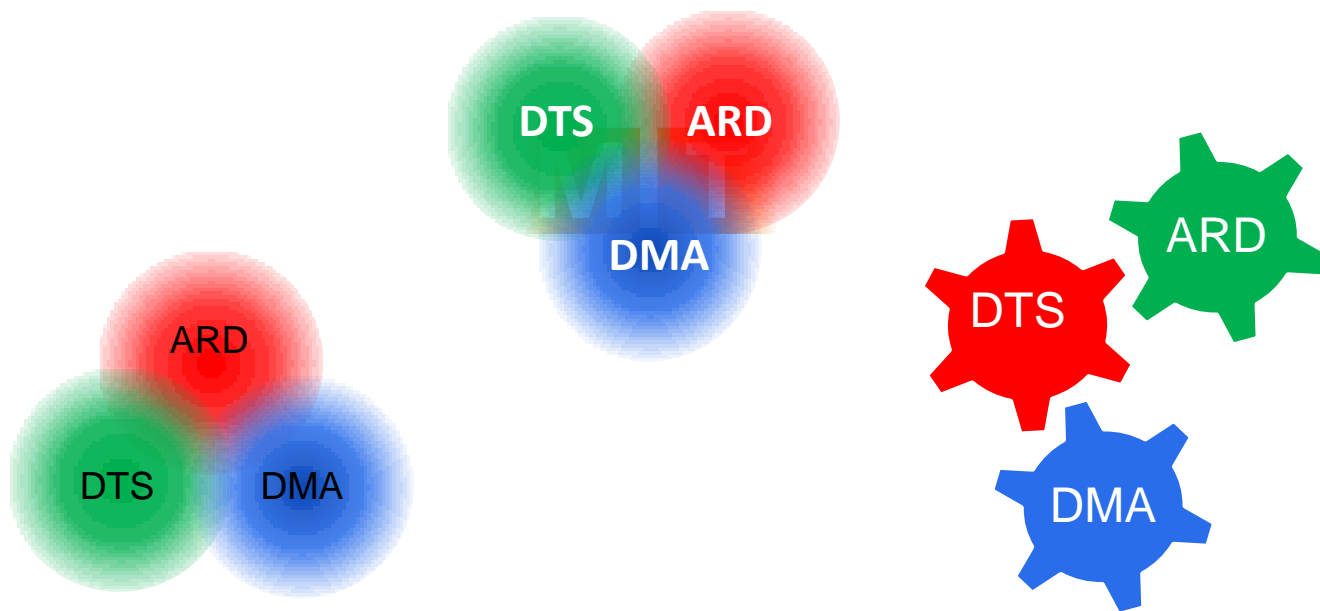
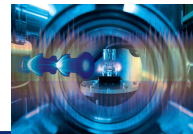
## Key Questions: User Facilities

- How would you rate the **quality** and the **relevance** of the facility on a **national, European or international level** now and (in view of planned / proposed upgrades, if applicable) towards the end of the forthcoming program period?
- What **role** does the facility play for the associated program and the research field in the forthcoming program period?

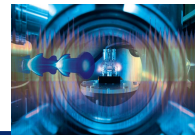
Where useful apply tables and pie-charts





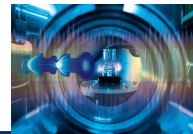






MT

MT



MT DMA

