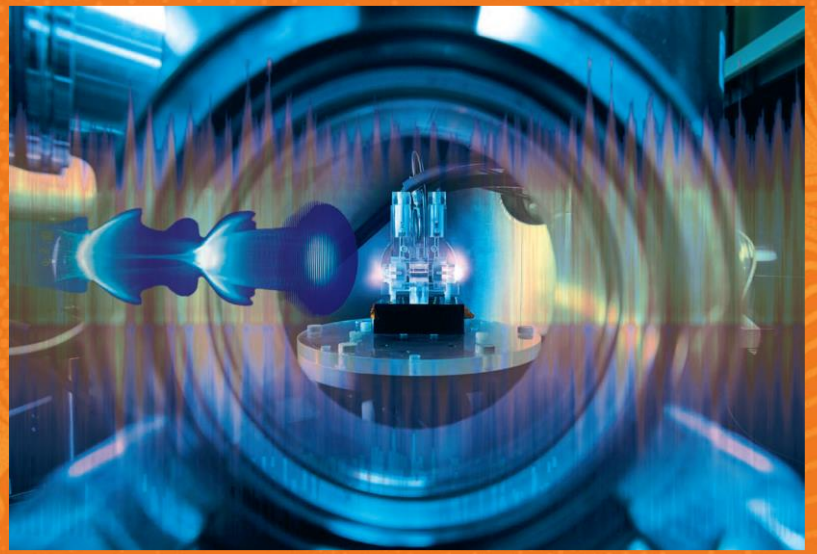
HELMHOLTZ

RESEARCH FOR
GRAND CHALLENGES

PROGRAM
Matter and Technologies

Starting PoF-IV



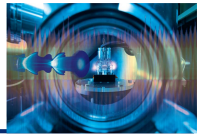
Anke-Susanne Müller, Ties Behnke

(MT Spokespersons)

DESY. · JÜLICH Forschungszentrum · GSI HI JENA HELMHOLTZ Helmholtz Institute Jena · HIM HELMHOLTZ Helmholtz-Institut Mainz · HZB Helmholtz Zentrum Berlin · HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF · Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung · IPP · KIT Karlsruhe Institute of Technology

Matter and Technologies

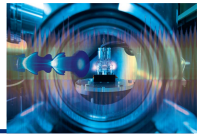
Our Team….



> 400 FTE/y
> 80 Mio EUR/y

From the 6th MT meeting
June 2020
Online only

The MT Structure in PoF-IV



Program *Matter and Technologies* (MT)
T. Behnke (DESY) | A.-S. Müller (KIT)

Topic *Accelerator Research and Development* (MT-ARD)
A. Jankowiak (HZB) |
J. Osterhoff (DESY)
DESY, FZJ, GSI* with HIM and HI Jena, HZB, HZDR, KIT

- Subtopic 1 *Advanced CW SRF Systems*
- Subtopic 2 *New Concepts and Prototypes for Maximizing the Performance of Hadron and Electron Accelerators*
- Subtopic 3 *Advanced Beam Control, Diagnostics and Dynamics*
- Subtopic 4 *Ultra Compact, Novel Accelerators and their Applications*

Topic *Detector Technologies and Systems* (MT-DTS)
M. Weber (KIT) |
S. Masciocchi (GSI)
DESY, GSI* with HIM and HI Jena, KIT

- Subtopic 1 *Detection and Measurement*
- Subtopic 2 *System Technologies*
- Subtopic 3 *Science Systems*

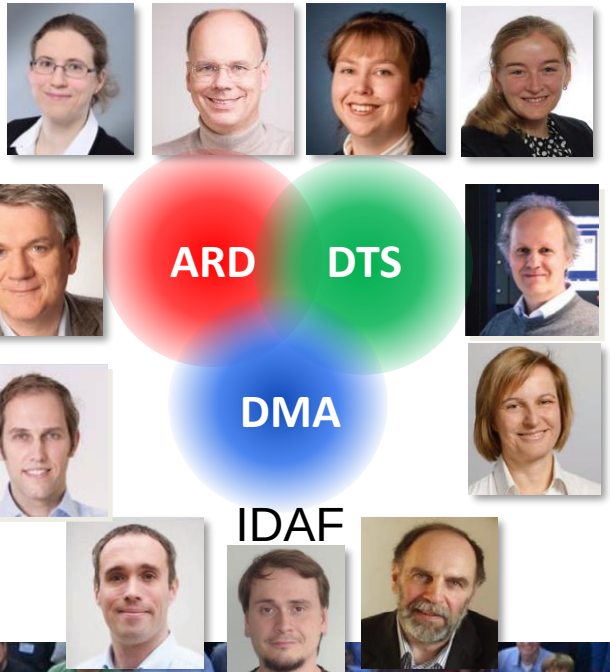
Topic *Data Management and Analysis* (MT-DMA)
M. Bussmann (HZDR) |
V. Gülzow (DESY)
DESY, FZJ, GSI with HI Jena, HZB, HZDR, HZG

- Subtopic 1 *The Matter Information Fabric*
- Subtopic 2 *The Digital Scientific Method*
- Subtopic 3 *The Digital Experiment and Machine*

LK I

User Facility IDAF
C. Voss

LK II



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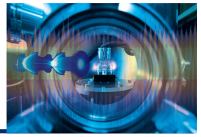

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LK I

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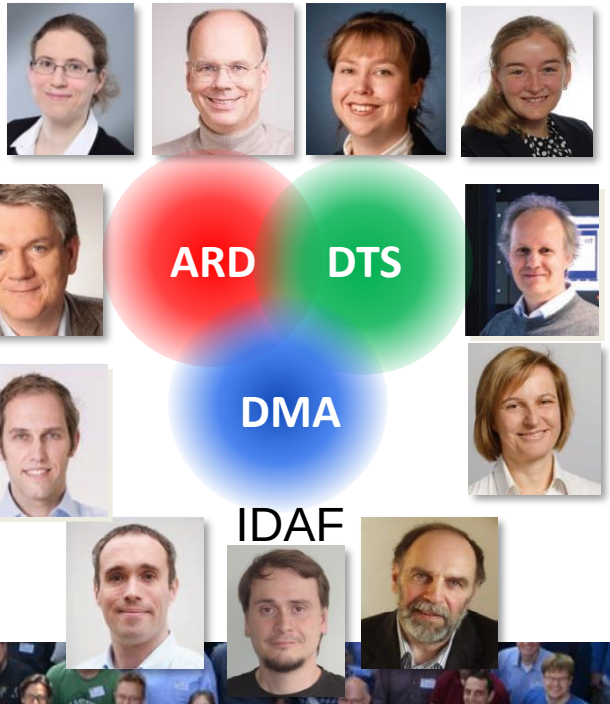
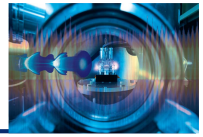
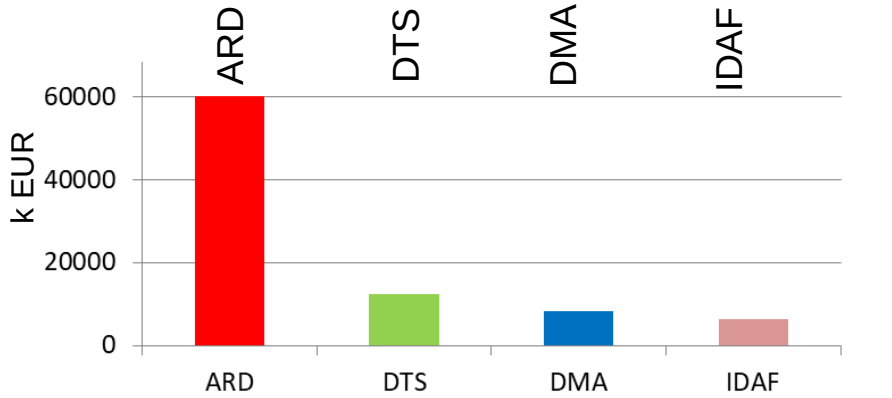
LK II



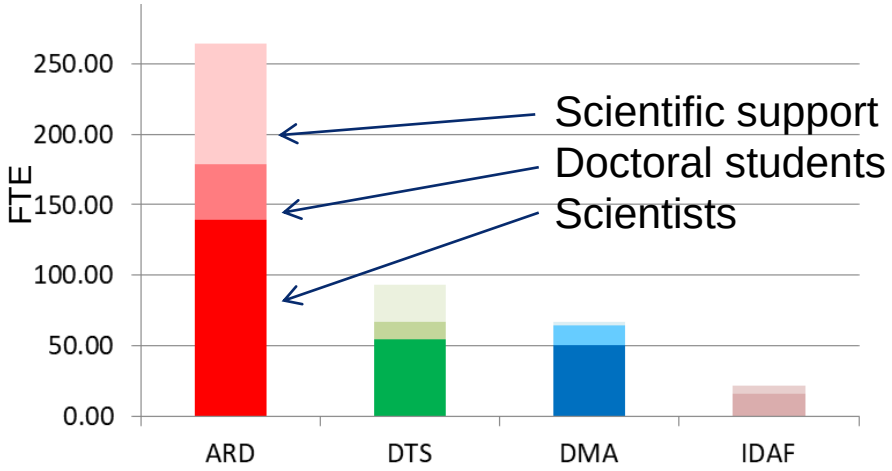
MT in numbers

Budget and people, PoFIV planning





2021

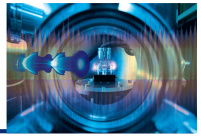


From 2017 to 2021:

67% increase in budget

The PoF-IV Evaluation

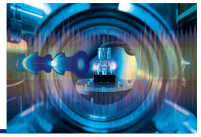
Concrete MT recommendations



	Funding category	Resource Plan
Matter and Technologies		
Accelerator Research and Development	A	confirmed
Detector Technologies and Systems	B	confirmed
Data Management and Analysis	B	confirmed

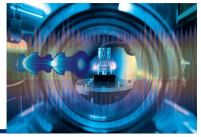
- ARD: To add a milestone on energy efficient R&D for future technical infrastructures and accelerator projects.
- DTS: Full support of the DDL proposal would retire the risk.
- DTS: Support sustainable career strategies, which ensure the availability of key technologists (e.g. ASIC engineers).
- DMA: This very strong vision should come to a mature project.

MT in PoFIV



- 2020: transition year from PoFIII to PoFIV
- 1.1.2021 PoFIV starts
  - Activities in the topics are re-organized along the new lines
  - DMA really ramping up
  - Digitization strategy Helmholtz
  - Position ourselves within the different Helmholtz strategies
    - Photon
    - Neutron
    - Others?
  - We need to deliver!

Matter: additional invest possibilities



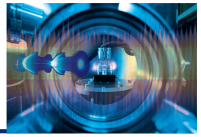
Major new projects on the Roadmap:
PetraIV, DALI, BESSY III, ACDC
International projects Icecube Gen2, DARWIN, ET, GCOS

Title	Invest	2023	2024	2025	2026	2027	2028	2029	2030
DDL (DESY,Jena, GSI, KIT	31.6 Mio								
HBS-P (FZJ, Mainz, HZG)	32.5 Mio								
GRIDKA	appr. 30Mio								

Invest proposals in Helmholtz

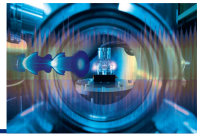
Roadmap process within Helmholtz, to prioritize invest projects:
For Matter DDL is on place 1.

Matter and Technologies Planning



- Ramp up the level of activities in the topics
- Establish benchmarking against our milestones
- Establish a tech transfer monitoring
- Establish a survey on career management
- Resubmit DDL

Innovation Pool Initiatives



Tangerine: modern Silicon CMOS detectors

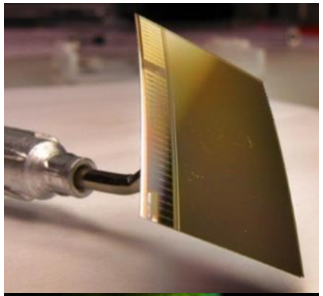
- Monolithic pixel detectors
- Fast 4D tracking systems
- Pixel detector innovation platform

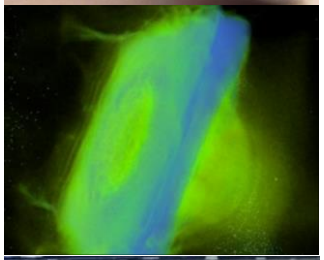
ACCLAIM:

- AI methods for plasma accelerators
- AI for accelerator tuning
- AI for anomaly detection
- ML methods for simulation

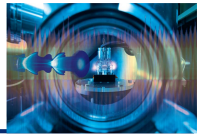
INNOVEEA

- Energy efficiency in accelerators
- Efficient components
- Efficient controls





Important Dates

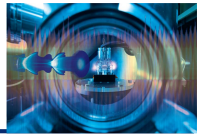


- Reporting
  - Annual reporting has started, deadline for submission Feb 22

- SAB May 2021
  - Chairs of center reviews/ Helmholtz and center management, speakers, guests
  - Review of the program activities, scientific advice on direction and strategy, monitoring of progress

- MT meeting June 2021:
  - June 15-19, format to be decided based on the situation
  - Stronger focus on invited keynote presentations

The meeting today and tomorrow

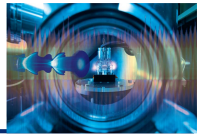


- Short review of the overall status of the program and its topics, news
- Presentation of new initiatives within the innovation pool

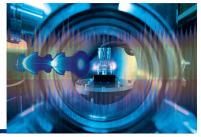
- Focus on discussions within the topics: status and planning for 2021 and beyond

- Only one topical highlight talk at the end

Summary



- We have gone through an excellent evaluation last year
- We are in an excellent position for a great start into PoFIV
- We need to keep up the momentum and firmly establish MT with all its topics
- Many thanks to all for your continued support and dedication



“Strategischer Beirat (SAB)” Forschungsbereich Materie

Hugh E.	Montgomery	Jefferson Lab, USA	DESY
Meigan C.	Aronson	Texas A&M University, USA	FZJ
Hideto	Enyo	RIKEN, Japan	GSI
Andrew	Harrison	Diamond Light Source, UK	HZB
Manfred	Fiebig	ETH Zürich, Switzerland	HZDR
Christina	Scheu	MPG, Germany	HZG
Andrew	Taylor	STFC, UK	KIT
Ursula	Bassler	IN2P3 - CNRS, France	Chair
Sine	Larsen	U Copenhagen, Denmark	Additional expert
Michael	Peininger	RI Research Instruments GmbH	Additional expert
Freddy	Bordry	CERN, Switzerland	Additional expert

participants in the meeting as guests:

- *President & Vice president HGF*
- *one director and one SAC member of each participating centre*
- *program speaker (and maybe topic speaker)*
- *representatives of Bund and Länder*