

Where do we come from?
Who are we?
Where do we go?



Where do we come from

POF3

Who are we?

MU and friends

Where do we go?

POF4



Our Schedule today

Mon 12/12

Participant List

Number of participants: 169

10:00	Registration and Coffee	
	<i>Helmholtz Institute Mainz</i>	10:00 - 11:00
11:00	Programm and Future in POF4	<i>Johannes BLÜMER</i>
	<i>Conference Room Ground Floor, Helmholtz Institute Mainz</i>	11:00 - 11:30
	Topic 1	<i>Thomas SCHÖRNER-SADENIUS</i>
	<i>Conference Room Ground Floor</i>	11:30 - 12:00
12:00	Topic 2	<i>Frank MAAS</i>
	<i>Conference Room Ground Floor, Helmholtz Institute Mainz</i>	12:00 - 12:30
	Topic 3	<i>Guido DREXLIN</i>
	<i>Conference Room Ground Floor, Helmholtz Institute Mainz</i>	12:30 - 13:00
13:00	Lunch	
14:00		
	<i>Mensa (vis-à-vis HIM), pass "Theke 1", reserved desks with free drinks</i>	13:00 - 14:30

Our Schedule today

2¹/₂ hours of parallel sessions

14:30	<i>Mensa (vis-à-vis HIM), pass "Theke 1", reserved desks with free drinks</i>					13:00 - 14:30
	Neutrino production in the sources of the U...	Relating EDM to fundamental CP-violating parameters	Higgs Mass Predictions in BSM models	What have we learnt from LHC about air showers?	Studying generalized dark matter interacti...	
15:00	Testing neutrino mass generation at the GeV scale:...	Analysis of B → K tau tau at Belle <i>Helmholtz Institute Mainz</i>	The Generic Approach to Higgs Mass Calculations	Underlying event and multiple parton interactio...	Axion dark matter from topological defects	
	Testing neutrino properties with IceCube		Finite-Volume Scattering and Resonances	Moving forward with atmospheric charm	FUNK dark photon search: status and perspectives	
16:00	Neutrinos in core-collapse supernova nucleosynthesis	Analysis of Tauonic B Decays	Theoretical status of the muon g-2	Measurement of quarkonium production at the...	Dark photon searches at MAMI and MESA	
	Testing neutrino properties with KATRIN: Stat...	Discussion forum on new physics in B→X tau tau decays	Vacuum Stability and the Origin of Mass	Hadronic contributions to g-2 from lattice QCD	Dark matter models with two mediators	
	Future activities of cross-topic "Neu..." <i>ALL</i>		Unitarization and Simplified Models for Vector Boson...	Discussion of plans and future activities	Phenomenology of flavoured dark matter	
17:00	Coffee					
	<i>Helmholtz Institute Mainz</i>					17:00 - 17:30

Our Schedule today

17:00

Coffee

Helmholtz Institute Mainz

17:00 - 17:30

Status and perspectives of LHC physics

Helmholtz Institute Mainz

Kirsztian PETERS

17:30 - 17:55

18:00

Status and perspectives of FAIR

Helmholtz Institute Mainz

Paolo GIUOBELLINO

17:55 - 18:20

Status and perspectives of CTA

Helmholtz Institute Mainz

Jim HINTON

18:20 - 18:45

19:00

Dinner with poster session: including poster contest (award sponsored by HAP)

20:00



Our Schedule tomorrow

Tue 13/12

09:00	Report from MML <i>Helmholtz Institute Mainz</i>	<i>Thomas STÖHLKER</i> 09:00 - 09:15
	Report from MT <i>Helmholtz Institute Mainz</i>	<i>Ties BEHNKE</i> 09:15 - 09:30
	Report from KET <i>Helmholtz Institute Mainz</i>	<i>Christian ZEITNITZ</i> 09:30 - 09:45
	Report from KAT <i>Helmholtz Institute Mainz</i>	<i>Christian WEINHEIMER</i> 09:45 - 10:00
10:00	Report from KHUK <i>Helmholtz Institute Mainz</i>	<i>Frank MAAS</i> 10:00 - 10:15
	Report from KFB <i>Helmholtz Institute Mainz</i>	<i>Oliver BOINE-FRANKENHEIM</i> 10:15 - 10:30
	Coffee <i>Helmholtz Institute Mainz</i>	10:30 - 11:00
11:00	Wrap-up of parallel sessions <i>please choose a rapporteur...</i>	
12:00	<i>Helmholtz Institute Mainz</i>	11:00 - 12:30
	Young investigator poster award <i>Helmholtz Institute Mainz</i>	12:30 - 12:35
13:00	Lunch	

Our Schedule tomorrow

		<i>Mensa (vis-à-vis HIM), pass "Theke 1", reserved desks with free drinks</i>	12:35 - 14:00
14:00	Gravitational waves		<i>Alex NIELSEN</i>
		<i>Helmholtz Institute Mainz</i>	14:00 - 14:45
	The Proton radius		<i>Randolf POHL</i>
15:00		<i>Helmholtz Institute Mainz</i>	14:45 - 15:30
	Concluding Remarks		
		<i>Helmholtz Institute Mainz</i>	15:30 - 15:45

mutag2016@lists.kit.edu

Name
Behnke Ties
Block Michael
Blümer Johannes
Braun-Munzinger Peter
Denig Achim
Diehl Markus
Drexlin Guido
Duellmann Christoph
Eitel Klaus
Engel Ralph
Haungs Andreas
Heiss Andreas
Jankowiak Andreas

Kauffmann Marie-Christine
Keilhauer Bianca
Keller-Rau Nicole
Kleifges Matthias
Klinkhamer Frans
Klotter, Sabine
Lindner Axel
Maas Frank
Martinez Gabriel
Mnich Joachim

Mnich Joachim
Niebuhr Carsten
Nierste Ulrich
Pulch Christian
Ritman James
Schleper Peter
Schoerner-Sadenius Thomas
Schomerus Volker
Servant Geraldine
Stegmann Christian
Steidl Markus
Ströher Hans
Valerius Kathrin

Vanderhaeghen Marc
Walter Winter
Walz Jochen
Weber Marc
Weiglein Georg
Weinheimer Christian
Wessels Johannes
Wittig Hartmut
Zeitnitz Christian
Zeppenfeld Dieter



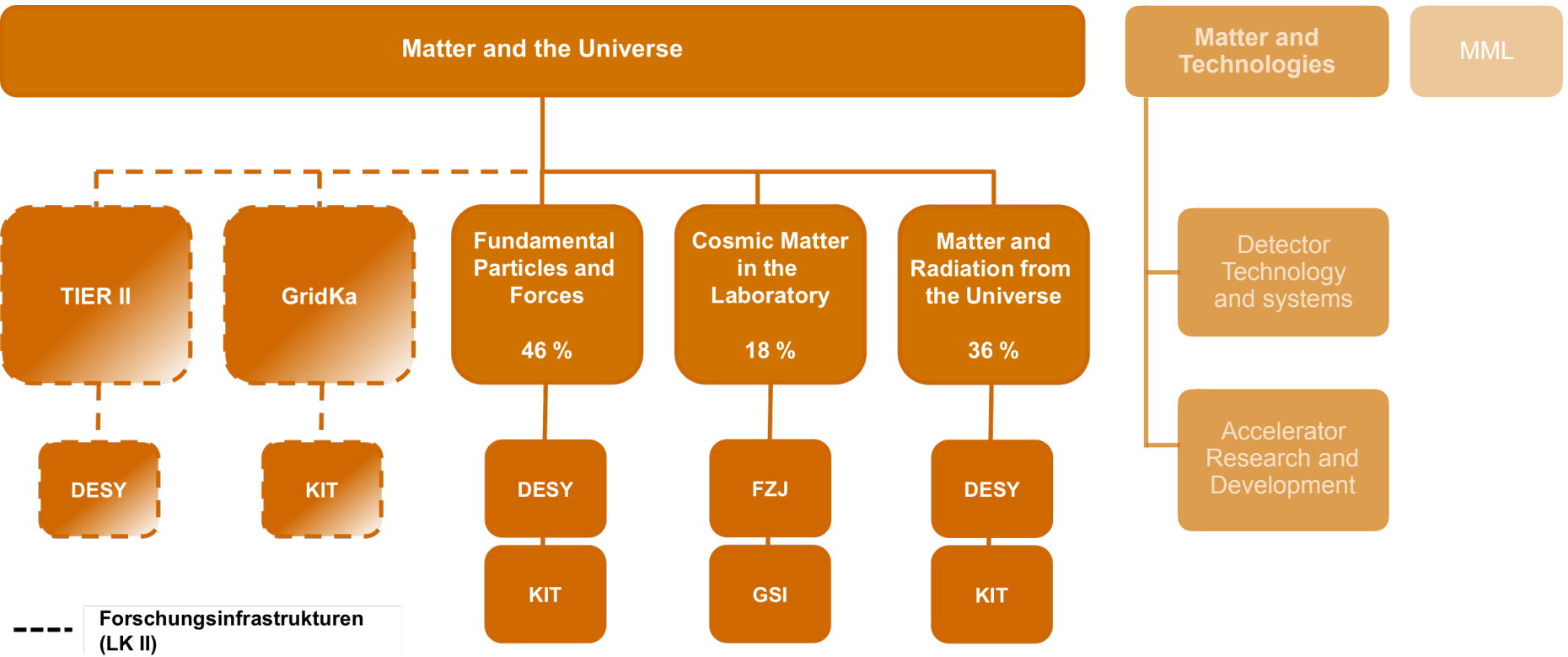
Matter and the Universe

Programme Overview

Johannes Blümer – KIT

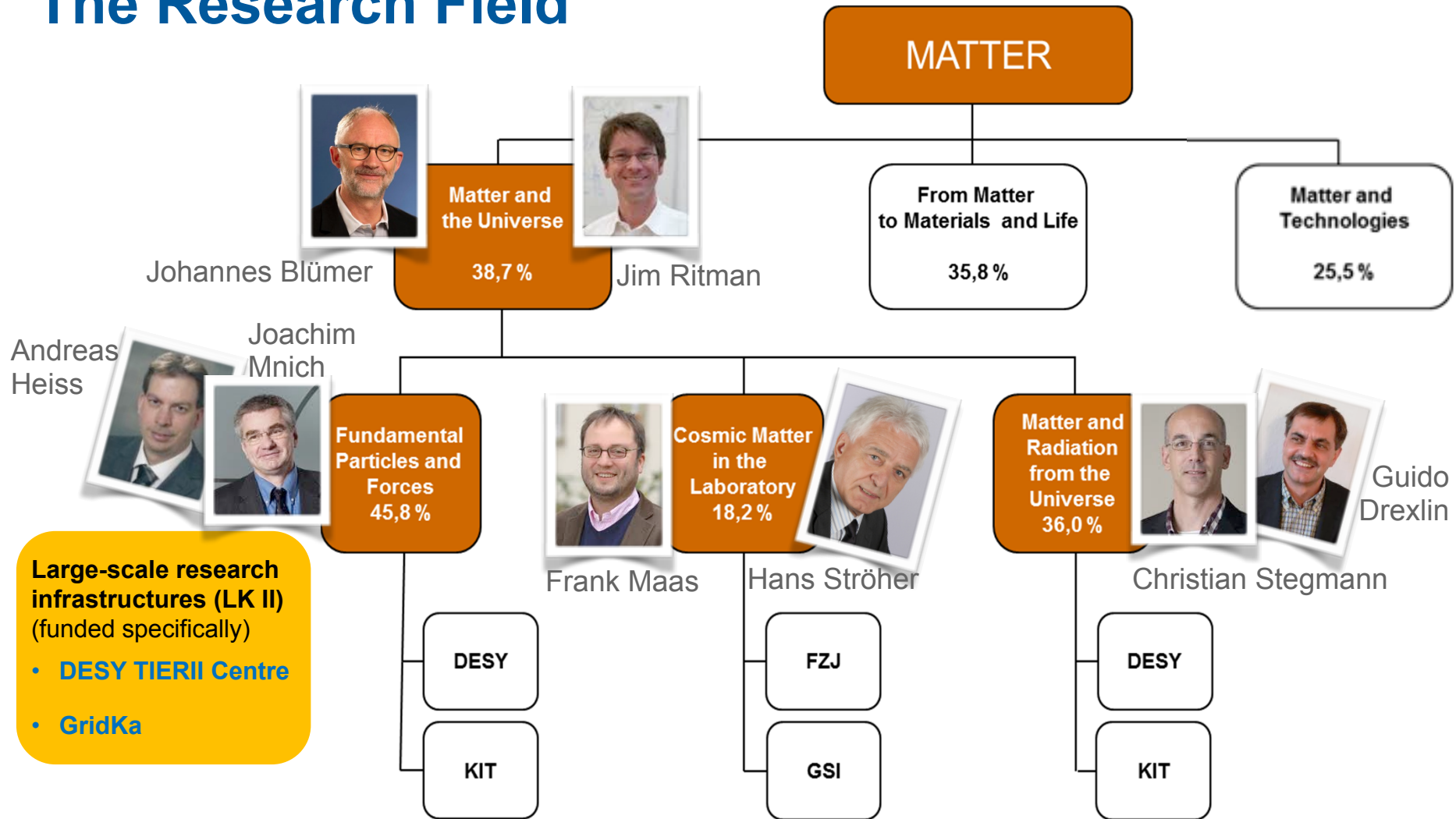
Das Programm im Überblick (1)

Programmübergreifende Aktivitäten



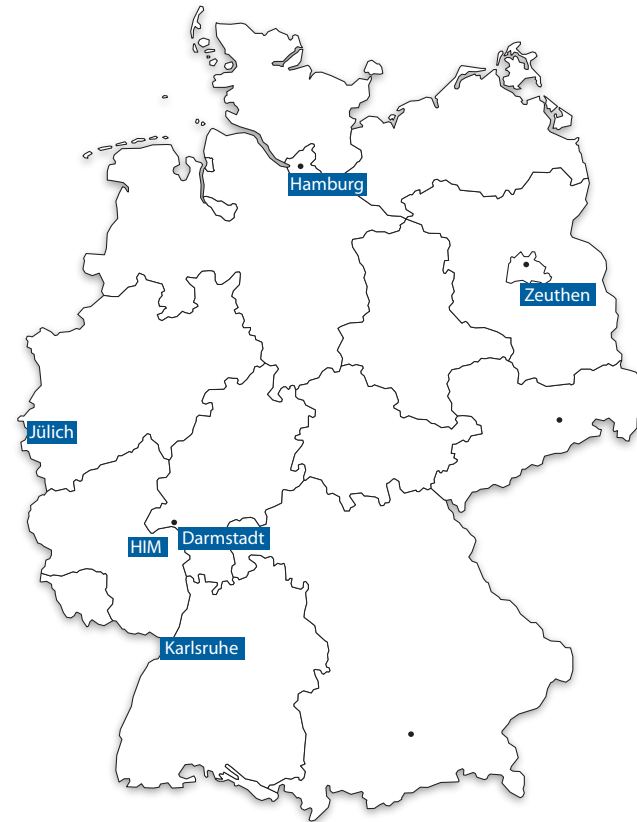
nun gemeinsam aus 3 Programmen

The Research Field

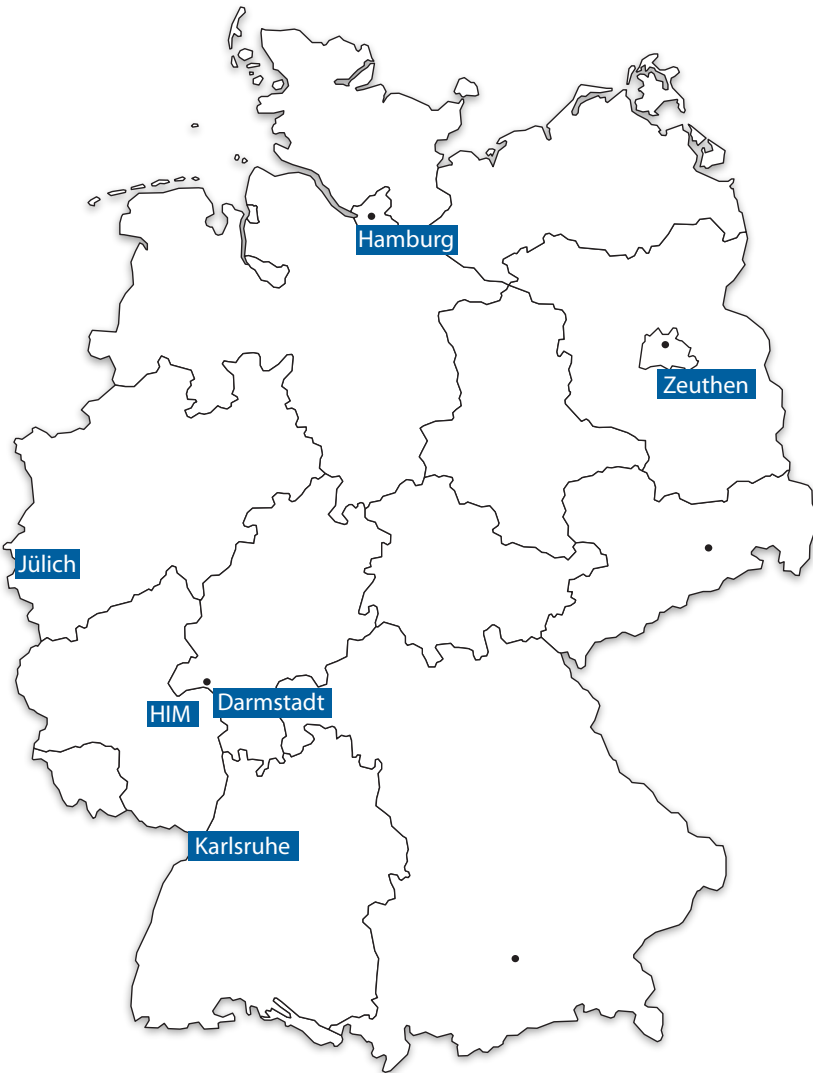


Some Helmholtz numbers

M€/a	DESY	FZJ	GSI	KIT	sum
MU	37	5	7	16	64
GridKa				10	10
Tier2	6				6
	total:				80
FAIR		15	87		102
FTE	218	17	49	116	400
Scientists FTE	152	12	25	53	242
Support FTE	31	3	11	57	102
PhD stud heads	69	4	25	12	110
MU headcount					557,2



Matter and the Universe Helmholtz centres



MU = {64 + 16} M€/a

eigenresearch + facilities GridKa, Tier2

~550 people, thereof ~110 doctoral students

core-funded by the programme-proper

large instruments

CMS, ATLAS, ALICE at the LHC, Belle at KEK, COSY, Auger, IceCube, H.E.S.S., ...

building CTA, KATRIN, FAIR; preparing the ILC

sister programme: MT

MU in Germany

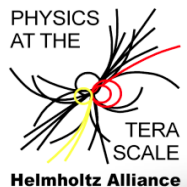
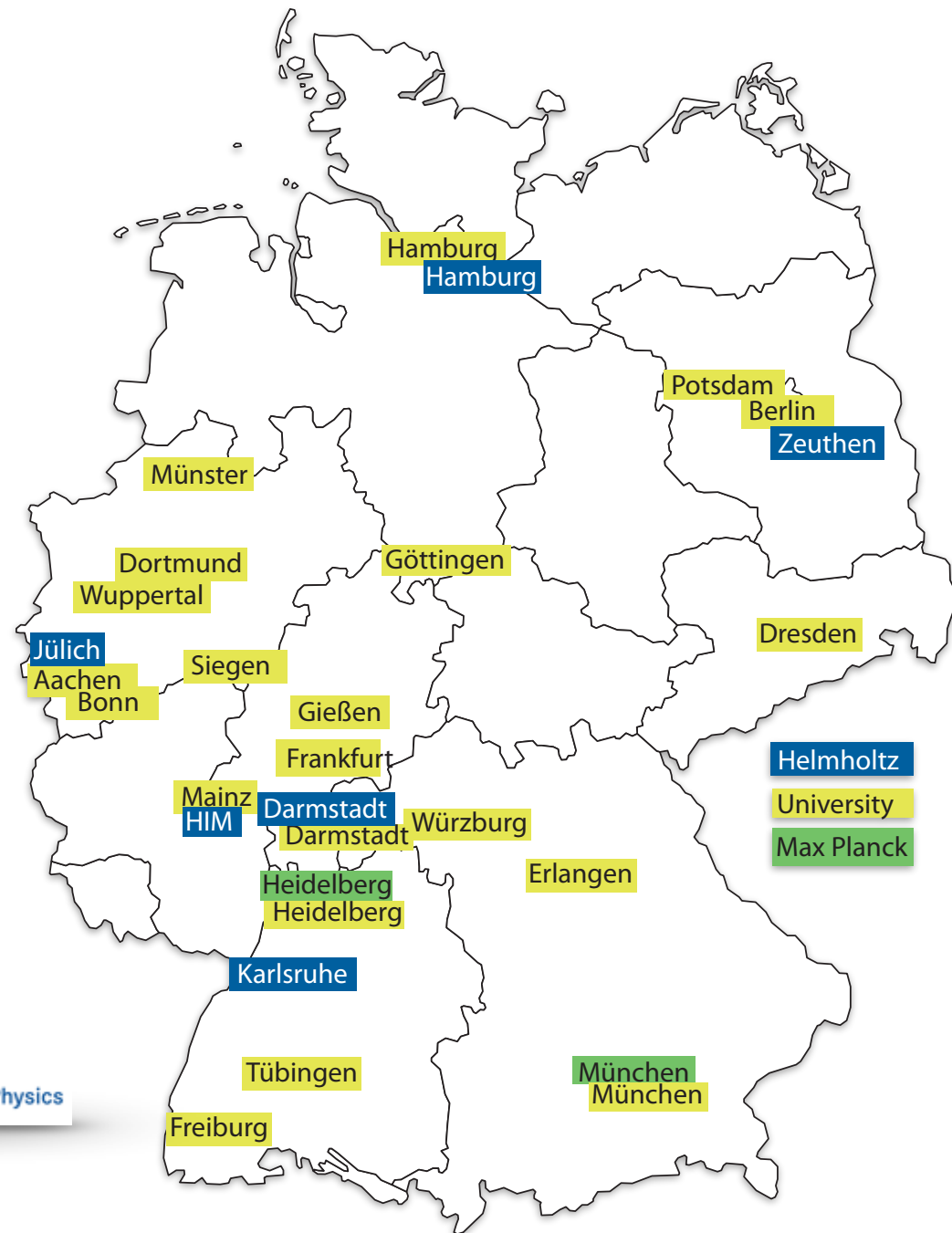
Helmholtz Alliances were important in the past...

Terascale | EMMI | HAP with ~1500 members, thereof ~400 PhD students

They had a structural impact on

- universities,
- communities,
- policies

... their spirits live on for a while...



Synergies and dynamics | Physics

*Elementary
Particle Physics*

*Astroparticle
Physics*

unification of fundamental interactions*

new forces and particles

nature of Dark Matter*

sky at extreme energies

neutrino properties*

origin of mass*

cosmic particle propagation

structure of hadrons

antimatter*

cosmic accelerators

strongly interacting matter*

nuclear structure

quark-gluon interaction

element synthesis

extreme and exotic matter

**Hadronic and Nuclear
Physics**

Synergies and dynamics | Technologies

*Elementary
Particle Physics*

*Astroparticle
Physics*

large channel numbers
radio purity
real time data processing
cryogenics
low noise
integration of complex systems*
high quantum efficiency
extreme environmental conditions*
large area/volume detector
high rate data transmission
low power*
vacuum technology
high resolution*
edge less sensors
large data volumes
parallel computing platforms
radiation hardness
low mass

**Hadronic and Nuclear
Physics**

Milestones and timelines

Table 3.1: The most significant milestones of the programme *Matter and the Universe*

Date	Topic	Milestone
2015	T1	Successful startup of the LHC at increased c.m. energies of 13–14 TeV
	T2	Spin coherence time studies for EDM completed by JEDI at COSY
	T3	Start of CTA construction
	T3	Start of upgrade of Auger surface array
2016	T1	Start of the Belle II physics programme with vertex detector installed
	T2	Precision measurement of the proton magnetic moment
	T3	IceCube data reaches three times its current volume of events
	T3	10,000 kg-days exposure in WIMP search with EDELWEISS
	T3	Start of regular KATRIN data taking with kg-scale tritium throughput
2017	T2	Concept for EDM precursor measurement at COSY finalized
	T2	Floating power-supply and min.-invasive beam diagnostics for HESR
	T2	Finish construction of PANDA/FAIR detector contributions by HIM
	T3	Begin of operation of upgraded Auger surface array
	T3	Commissioning of the 1 st phase of the next-gen. cryogenic DM search
2018	T1	Collection of 100 fb ⁻¹ of data at the LHC before LS2
	T2	EDM systematic error studies for COSY completed
	T2	Design report for dedicated precision EDM storage ring ready
	T2	PANDA detector parts installed and pre-calibrated at FAIR
	T3	LoI for future multi-km ³ IceCube extension submitted
2019	T1	Collection of 10 ab ⁻¹ with Belle II at SuperKEKB
	T2	First direct (p,d) EDM measurements conducted at COSY
	T2	Start data taking at FAIR
	T3	CTA reaches design performance
	T3	KATRIN publishes high sensitivity neutrino mass result

A healthy mix
of planning,
development,
construction,
physics
harvest at any
given time

New developments

The **WR** has evaluated Helmholtz' POF System
mixed reactions, some consequences

Helmholtz Governance is to be updated
not today's topic — want to see it anyway?

Where is the **dynamics**?

For MATTER: it's in the subtopics: *topic presentations*

The **evaluation** scheme is being changed

A two-stage process, important, requires immediate
attention at all levels of our organisation(s)

The **strategy** must be updated.

KÜNFTIGE GREMIEN DER FORSCHUNGSBEREICHE

- **Board**

Mitglieder: Vorstände der beteiligten Zentren

Vorsitz: Vizepräsident

- **Forschungsbereichsplattform**

Mitglieder: Board (ggf. ergänzt um Programmsprecher),

AL von BMBF/BMWi und Ländervertreter

Gäste: Präsident und Vertreter des Strategischen Beirats

Ko-Vorsitz: Vizepräsident und BMBF/BMWi-Vertreter

- **Strategischer Beirat**

Mitglieder: 10 internationale Experten (darunter die Vorsitzenden der wissenschaftlichen Begutachtung)

Gäste: Forschungsbereichsplattform und fachnahe Senatoren

Vorsitz: noch zu diskutieren (Präsident / internationaler Experte)

Where is the dynamics?

MATTER has been reconfigured from POF2 to POF3.

The programme structure remains stable,

MU — MML — MT

MU had a lively discussion of its topic structure. We found no better arrangement than FPF•CML•MRU

A clear(er) subtopic structure is desirable.

ENERGY: from 7 programmes to 4

KEY TECHNOLOGIES: work in progress

[MUPOF4@
lists.kit.edu](mailto:MUPOF4@lists.kit.edu)

missing?
tell me

you are entitled to

- read and write
- listen and speak

you should not

- do nothing

Name
Blümer, Johannes
Buchwald, Christiane
Drexlin, Guido
Eitel, Klaus
Engel, Ralph
Haungs, Andreas
Heiss, Andreas
Kauffmann, Marie-Christine
Keilhauer, Bianca
Keller-Rau, Nicole
Kleifges, Matthias
Maas, Frank

Mnich, Joachim
Nierste, Ulrich
Pulch, Christian
Quast, Günter
Ritman, James
Schörner, Thomas
Schwetz-Mangold, Thomas
Stegmann, Christian
Steinhauser, Matthias
Streit, Achim
Ströher, Hans
Valerius, Kathrin
Weber, Marc

Zur Topic-Struktur

MU Programmtreffen
Nov 24, 2016

PDF
odes
STDF
COF(F)

FB	Prog	Topic	Subtopic	Zentren	Projects
Materie	MU	FPF	pp Collider LHC phys e+e- Physics Theory	DESY DESY DESY, KIT DESY KIT	ATLAS, CMS Belle, ILC Tier2 Tier1
	MU-LK2	Tier2 GridKa	Computing + Greencube? Symm.		
	1	hot QCD	Preparation for FAIR EDM Hadrons at HIM	GSI, FZJ	
	2	cold		FZJ	
	3	elem. sym.		GSI	
	4	symm.			
		CML 4 • FMa			
	MRU		Non-Thermal Universe Neutrinos $\leftarrow \begin{matrix} \nu \\ \nu \text{ mix} \end{matrix}$ Dark Matter	KIT, DESY KIT, DESY KIT, DESY	Cosmic Rays HE-neutrinos Gamma rays KATRIN PINGU' EDELWEISS (EURECA) indir searches
MT	ARD		SC RF Science and Tech Hadron Accelerators Short pulses Novel Acceleration	GSI	
	DTS		Sensors, ASICS, Interconnects Data Transmission and Proc Detectors Systems Det Tech and Society		
	MML	(Facilities)	(... Brilliant light sources...)	(KIT no more)	
	In-House rs.		Extreme states of matter Q.condensed matter Magn, SC and beyond Mat and proc for energ and transport techn Nanoscience and mat for inf Soft matter, health and life sciences	KIT KIT KIT	

The new evaluation scheme

Stage 1: Assessment of the scientific contributions of Helmholtz Centres that participate in a programme; short preview of the strategy of the Research Fields
~30 panels, 700 reviewers; from 1 panel/RF to compact thematic arrangements; visits from fall 2017 to mid 2018; period under review: POF3 or 4 years back

Stage 2: Assessment of the strategy at the level of Research Fields
thereafter; details not yet defined

Resumée: derive budgets from the results for POF4
nominal period is 5y (2020-2024) — or 7yrs (2021-2027)

What do we have to do?

Read, contemplate, discuss the **strategy document** that is being prepared for the **MATTER Retreat January 16+17, 2017**; this is input to the Member Assembly Jan 24 and to the Senate in June.

Prepare for the Stage 1 evaluation:

Research Field part: RF Coordinator

Programme parts: Programme spokespersons

Describe your contributions i

Volume I and II as before

Large infrastructures are treated like a programme

Have a draft by end of June, 2017

Strategy paper outline

Your help is needed

Gliederungs-punkt	Titel		Seitenzahl	Verantwortung
1.	Überblick zum Forschungsbereich Materie			H. Dosch
1.1.	Aktuelles Forschungsportfolio und beteiligte Zentren		1,5	
1.2.	Positionierung im nationalen und internationalen Kontext		0,5	
1.3.	Rolle der Infrastrukturen		0,5	
2.	Herausforderungen der nächsten 5 – 10 Jahre des Forschungsbereichs Materie		1	Programmsprecher
3.	Zukünftige thematische und programmatische Aufstellung des Forschungsbereichs Materie			
3.1.	Überblick zur zukünftigen Struktur des FB Materie		0,5	H. Dosch
3.2.	Aufstellung der Programme			Programmsprecher
3.2.1.	MU	Strategische (wiss.) Ziele	1	J. Blümer
3.2.2.	MML		1	T. Stöhlker
3.2.3.	MT		1	T. Behnke
3.3.	Infrastrukturen (Roadmaps)		0,5	H. Dosch
3.4.	Kooperationsstrategien			Programmsprecher
3.5.	Innovation und Transfer		1 zusammen	H. Dosch
3.6.	Talentmanagement			HZB
3.7.	Forschungsbereichsübergreifende Themen: <ul style="list-style-type: none"> – Information/Big Data – Strukturbiologie – Materialforschung 		1,5	M. Bussmann E. Weckert <i>O. Kraft (KIT) bzw. M. Müller (HZG): wird noch innerhalb von MML geklärt</i>

Shake-up

Got the Higgs, your're done!

LHC full exploit: ATLAS, CMS; $e+e-$ precision physics with Belle II; prepare for ILC and maybe for DUNE; theory

Is it FAIR?

hot and cold QCD; from hadrons to (superheavy) elements; symmetries (EDM); FAIR “phase 0”

Only blue sky?

Messengers: γ (G); AugerPrime, CTA, IceCube Gen-2
KATRIN approaching $m\nu$ Dark Matter: still hiding

Big Data becomes “Data Science” — Research Field INFORMATION?

Coming up next

Topic 1

Fundamental Particles and Forces

Thomas Schoerner-Sadenius

Topic 2

Cosmic Matter in the Laboratory

Frank Maas

Topic 3

Matter and Radiations from the Universe

Guido Drexlin