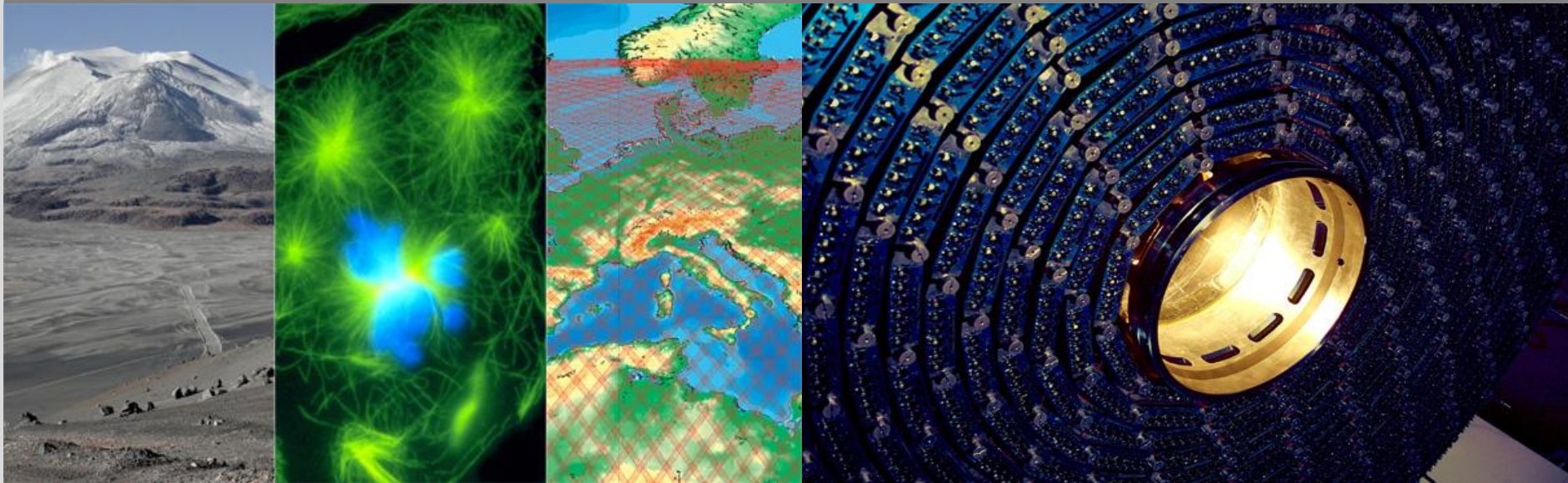


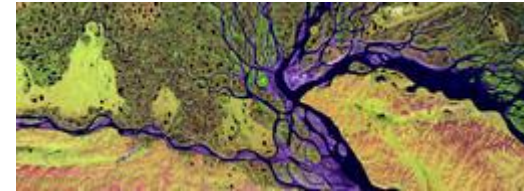
Detector Technology and Systems Platform Berlin Workshop Plans 2013 - 2019

Christiane Buchwald



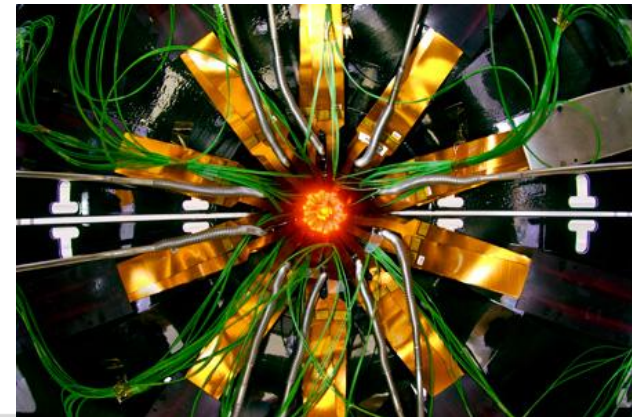
Research Fields of the Helmholtz Association

- Energy
- Earth and Environment
- Health
- Key Technologies
- Structure of Matter
- Aeronautics, Space and Transport



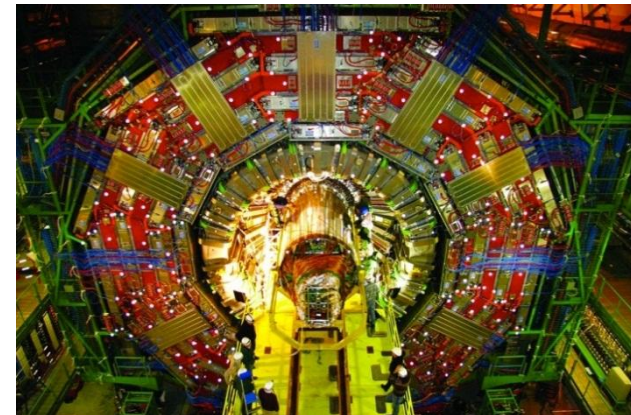
Program Oriented Funding (POF)

- POF II: will end 2014
- POF III: will start in 2015
- Funding Period: 5 years



From Portfolio to POF III

- The portfolio extension will become a new program topic 3.2 „Detector Technology and -Systems“ in the program „Matter and Technology“
- The funding of the portfolio will thus be continued beyond 2015.
- Deadline for funding proposals in the research field „Matter“ is **1st November 2013.**
- BUT: The outline of the proposal is required at **19th June 2013.**



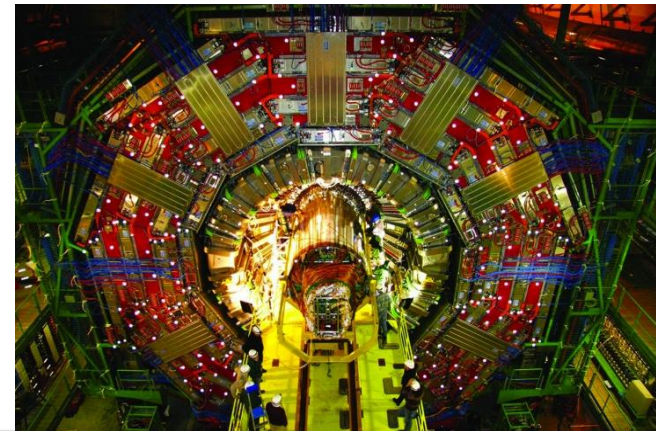
POF II: „Structure of Matter“

- Elementary Particle Physics
- Astroparticle Physics
- Hadrons and Nuclear Physics
- Research with Photons, Neutrons and Ions (PNI)

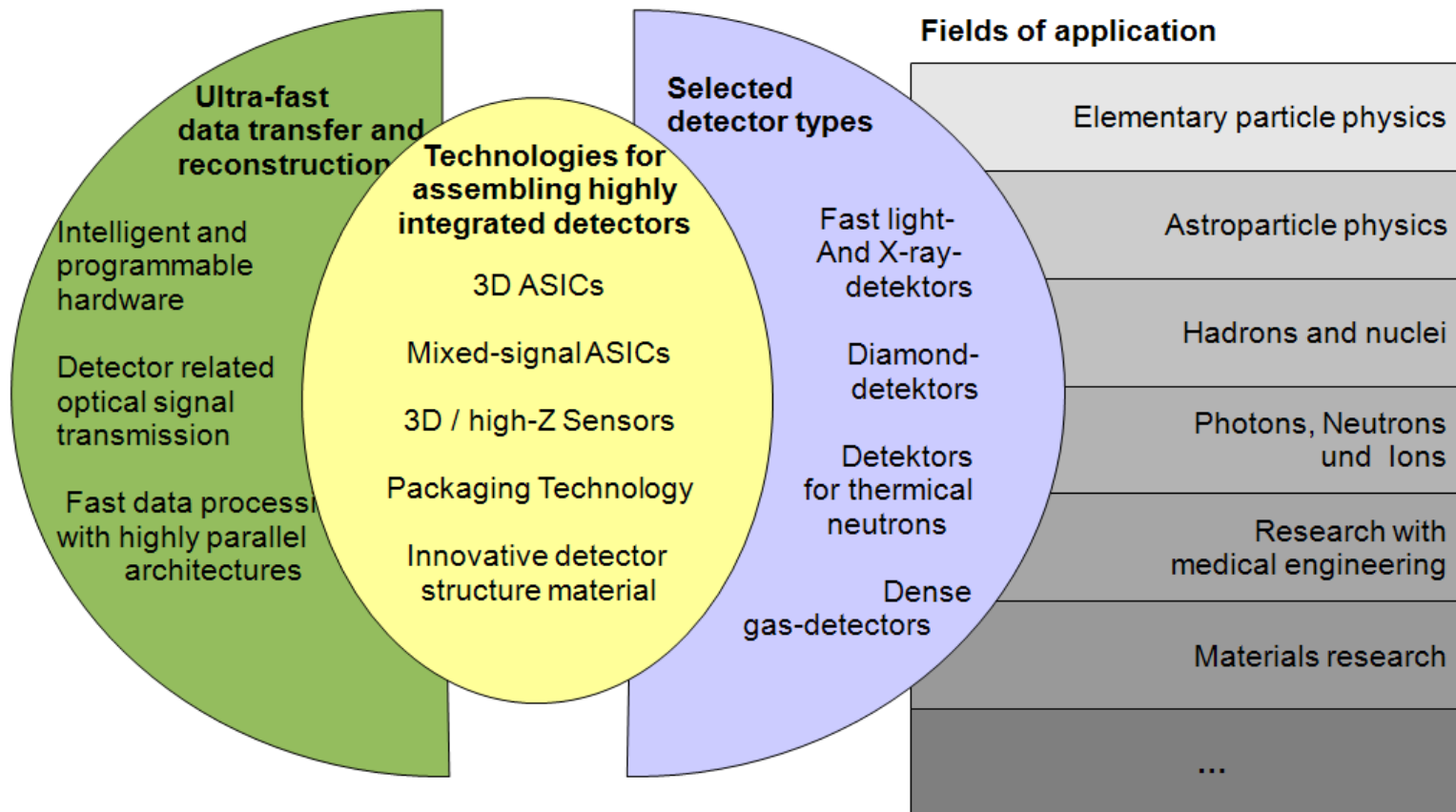


„Structure of Matter“ becomes „Matter“

- Program 1: Matter and Universe
- Program 2: From Matter to Materials and Life
- Program 3: Matter and Technology
 - 3.1. Accelerator Research and Development
 - **3.2. Detector Technology and -Systems**



This is the structure of the current platform



Work packages in program topic 3.2 (preliminary)

		DESY	FZJ	GSI	HIJ	HIM	HZB	HZDR	HZG	KIT	FTEs
S1 Technologien zum Aufbau hochintegrierter Detektoren											
1	Mixed-signal + 3D ASICs, monolithische Se	24		2,0						3,5	29,5
2	3D + Hoch-Z Sensoren, Strahlenhärte von S				0,5					2,5	3
3	Aufbau- und Verbindungstechnologien			1,0						4	5
4	Innovative Detektorstrukturmaterialien			0,5		0,5					1
S2 Ultraschnelle Datenübertragung und -au											
5	Intelligente programmierbare Hardware	7	2,5	0,5						2	12
6	Detektornahe optische Signalübertragung			0,5						2	2,5
7	Schnellste Datenverarbeitung mit hochparallelen Architekturen							1		2,5	3,5
8	Ultrafast Detectors										
S3 Exemplarische Detektortypen											
9	Schnelle Licht- und Röntgendetektoren	13	2,5		0,5	0,5		0,5			17
10	Diamantdetektoren, hochauflösende Bolometer,			1,0	0,5					0,5	2
11	thermische Neutronen										0
12	Kompakte Gasdetektoren			1,0		1,5		8,5			11
13	Detektoren der Astroteilchenphysik							1		3	4
S4 Querschnitt											
								1			1
	Summe FTEs	44	5	6,5	1,5	2,5		12		20	91,5

What should be the structure in POF III?

Example A:

- Ultrafast data transfer and reconstruction
- Technologies for assembling highly integrated detectors
- Selected detector types

Example B:

- Enabling Technologies
- Interfacing detector and user
- Demonstrating technologies

Example C:

- ...

Questions for Discussion I

- General organization of pillars and work packages?
 - Matrix of technologies and applications

- Key topics for the proposal?
 - Review of the existing work packages for PoF III?
 - Additional (ground breaking) topics?
 - Personal effort / Milestones

- Are there new technologies?
- What results can be expected until 2019?
(especially for 3D technologies)

- What are key contributions to applications and further experiments?
- Do we cover all technologies needed for the next generation of sources and accelerators?

Questions for Discussion (cont.)

- Overlap / Interface to programme „SuperComputing and Big Data“?
- What is our potential for collaboration with industry / Spin-offs?
- Helmholtz likes women in executive positions
 - Proposals are most welcome
 - Further candidates for work packages?

„Benchmarks from Prof. Mlynek“

■ Standing

- International reputation of collaboration?
Is the science/topics world leading?

■ Balance

- Why do we choose these topics?
- Priorities and posteriorities

■ Potential (opportunities)

- Think big, act big
- What do we want to achieve in five years?
- Where do we make a difference?

„Suggestions for parallel sessions

- Check why this research is crucial and indispensable for your future experiment
- Why can this technology not be bought or better be developed elsewhere?
- Consider what not to do and why not.
- Which demonstrator do you need?
- Where are opportunities for spin-offs outside of „Matter“?

Always be as specific as possible!

„Requirements from BMBF

(„Forschungspolitische Vorgaben“)

- No blue skies research !
- Detectors must serve specific needs of science of (future) accelerators and sources

Matrix: Technologies vs. Applications?

S3 Detector prototypes Photon + X-ray detectors HGF-cube Diamond, bolometers Application from FAIR Thermal neutrons Application ESS Compact gas detectors Det. for astropart. Phys. Cross-Disciplinary App. In-Vivo Dose Imaging ... Dose-Free Diagnostic ... Neutron Radiography													
S1 Technologies for integrated detectors													
1	Mixed-signal ASICs, 3D-ASICs, monolithic sensors												
2	3D + high-Z sensors, radiation hardness of sensors												
3	Electronic packaging technologies												
4	Advanced materials												
S2 Ultrafast communication and analysis													
5	Intelligent programmable electronics												
6	Detector-proximal optical signal transmission												
7	Ultrafast data processing with parallel architectures												
8	Ultrafast detectors												
Supplementing contributions from partners													
	Application knowledge (e.g. HDRI / MML)												
	X-ray optics												
	Partners (IN2P3, Mpi)												
	Fraunhofer, industry, ...												

Evaluation of work packages (initial guess)

		adequate manpower	scientific depth	competence within HGF	international standing	use for ... (XFEL, FAIR, ...)	strategic relevance
S1 Technologies for integrated detectors							
1	Mixed-signal ASICs, 3D-ASICs, monolithic sensors	A	A	A			A
2	3D + high-Z sensors, radiation hardness of sensors	A/B	A	A			A
3	Electronic packaging technologies	A	B	A			A
4	Advanced materials	B/C	B	B			A
S2 Ultrafast communication and analysis							
5	Intelligent programmable electronics	B	A	A			A/B
6	Detector-proximal optical signal transmission	B/C	A	B			A
7	Ultrafast data processing with parallel architectures	B	A	B			A
8	Ultrafast detectors	A/B	A	A			A/B
S3 Selected detector prototypes							
9	Fast photon and X-ray detectors	B	A	A/B			A
10	Diamond det., high-res. bolometers, cryogenic det.	A/B ?	A	A			A
11	Neutron det. / szintillators, thermal neutrons	?	A	A/B			A
12	Compact gas detcktors	A	A	A			A
13	Detectors for astroparticle physics						

Material for parallel sessions

Workpackage	
WPL:	
old Focus	
new Focus	
FTEs	
Milestones	
Vision / Goal	
Application	
Self ranking	
Prototype/Demonstrator	

POF II

■ Period 2013 - 2014

- Goals
- Milestones
- Results

Please keep POF III in mind, when planning POF II