

DESY - the next 5 years

The process

DESY and the Research Area 'Structure of Matter'

The program outlines

Extended Scientific Council

26 May 2008

Helmholtz Evaluation: DESY 2010-2014

The present period of program oriented funding within the Helmholtz Association ends in 2009

In 2008 the research area 'Structure of Matter' will prepare the programs for the period 2010-2014, which will be evaluated in 2009.

In November 2007 the Helmholtz Senate has discussed the research policy guidelines and the key points of the programs as seen by the participating centers.

DESY will participate again in three programs: EP, AP, Photons (PNI)

The key elements in the three programs are summarized below:

Helmholtz-Association



Research Centers: 15

Employees: ~ 24 000

Funding (Bill. Euro)

BMBF ~ 1,3

BMBF + states 1,6

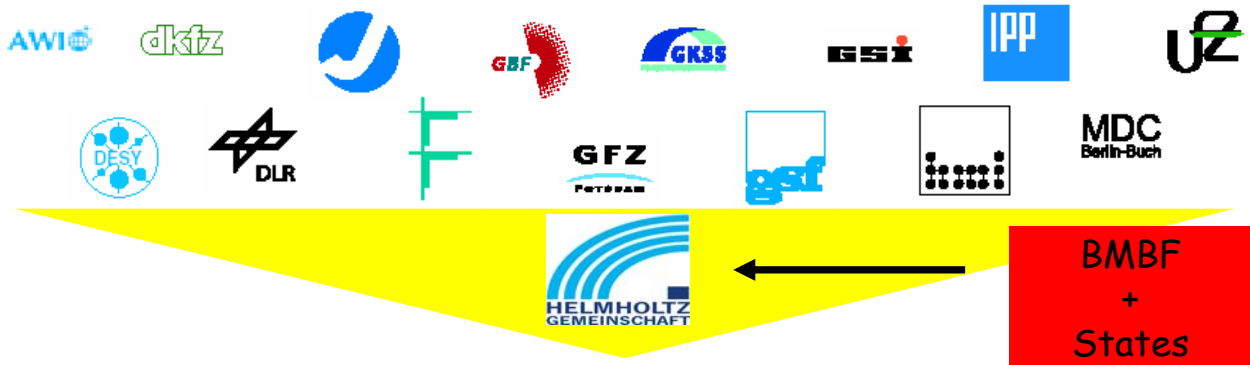
overall funding 2,1

Ratio Bund/Länder: 90:10

Albrecht Wagner, ESC, 26

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Programme-oriented Funding



- Health
- Transport and Space
- Energy
- Earth and Environment
- Structure Of Matter
- Key technologies

Albrecht Wagner, ESC, 26 May 2008

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Research Area 'Structure of Matter'

Coordinator: Albrecht Wagner

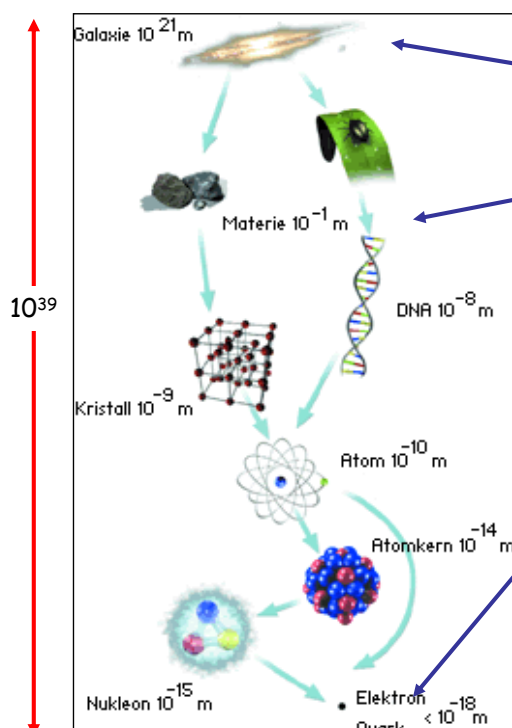


Participating Helmholtz Centres

Albrecht

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Focus of Research of DESY



- Cosmology with particles from the Universe (Neutrinos)
- Analysis of the structure of materials and matter, from crystals to molecules and atoms
- Exploration of the fundamental building blocks of matter and the forces in the Universe, development of the early universe
- Theory
- Development, construction and operation of large research facilities

DESY Research

Particle- and Astropart. Physics	Accelerator Developmt/Operat.	Research with Photons
HERA	DESY + Preacc.	DORIS
LHC	DORIS	FLASH
ILC	FLASH	PETRA III
Theory	PETRA III	CFEL (XFEL)
Detectors	PITZ	Detectors
Icecube	XFEL	
	ILC (SCRF)	

Science Policy Guideline

Basis for the **scientific** and **strategic** evaluation is a document by the Funding Agencies, called 'Forschungspolitischen Vorgaben' (Science Policy Guideline).

The emphasis is on the **strategy**.

These contain political goals defined on a broad scale, and the overall funding profile for the 5 years of the programs.

The budget increase announced by the government of 'Structure of Matter' is 1.4%/y for 2010, 2011.

The funding is defined for the research area, not the programs.

Science Policy Guideline - 2

In addition to these general statements, the guidelines outline what BMBF and Länder want to see included in the individual programs.

The following slides show the outline of the programs as defined by the participating centers.

These programs are in full agreement with the guidelines.

Overall Science Policy (BMBF)

- Bereitstellung leistungsfähiger **Forschungsinfrastrukturen**, insbesondere von Großgeräten und Forschungsplattformen für international wettbewerbsfähige Forschung in Natur- und Ingenieurwissenschaften, und ihrer kontinuierlichen Fortentwicklung auf höchstem Niveau,
- Gewährleistung eines **offenen Zugangs** zu den Großgeräten einschließlich **wissenschaftlicher Unterstützung** für Nutzer aus dem In- und Ausland,
- Nutzung der Großgeräte für **kompetitive eigene Forschung** und Erarbeitung international gewichtiger Beiträge zur Aufklärung der Struktur und Dynamik von Materie in all ihrer Vielfalt und auf weiten Längen- und Zeitskalen in enger Zusammenarbeit innerhalb der Helmholtz-Gemeinschaft und mit anderen Wissenschaftsinstitutionen im In- und Ausland.

Particle Physics - 1

DESY, as one of the leading worldwide centres in particle physics, will no longer operate its own large accelerators in this programme in the coming programme period. [The purpose of the programme](#) is to ensure international competitiveness of German particle physics.

- Strong [participation in two of the LHC experiments](#) (ATLAS and CMS). At the same time, the precision analyses of the [HERA](#) experiments will be concluded, whose results are also of great significance for the LHC analyses.
- Further expansion of the Karlsruhe grid computing centre (GridKa) at FZK, an international data and high-performance computer centre, as well as the [Tier2 centre \(ATLAS, CMS, LHCb\)](#) and the [analysis centre at DESY](#).

Particle Physics - 2

- [Theoretical studies](#) in close connection with experimental activity as well as research in areas of the particle/astroparticle physics interface and in the field of string theory. The lattice-gauge theory, including R&D for new high performance computers, will be continued at the Zeuthen location in close cooperation with the activities at the John von Neumann Institute.
- In agreement with the European Strategy for Particle Physics, cooperation in further [development of superconducting accelerator technology](#) for the International Linear Collider (ILC), in which DESY plays a leading role worldwide. Utilization of synergies between XFEL and ILC.
- [Detector development](#) for a luminosity upgraded LHC and for precision experiments at ILC, contributions to development of detectors for the XFEL.

[Helmholtz Alliance 'Physics at the Terascale is a key element](#)

Astroparticle Physics

- The [IceCube](#) neutrino telescope will be completed and therefore guarantee completeness of the results in the next programme with the new aspect of [multimessenger analysis](#), the combination of neutrino- astronomy with particle and gamma astronomy. In this context DESY is planning to participate in the [preparatory work for the Cherenkov Telescope Array \(CTA\)](#).
- Own [theoretical work](#) in astroparticle physics will be conducted in close cooperation with the University of Potsdam.

Photons - 1

At the " Helmholtz Centre Berlin (HZB)", which is being formed in 2009 by [uniting BESSY with HMI](#), the possibilities of complementary use of photons and neutrons to investigate magnetic materials, for example, will be utilized in particular.

- **Photons:**
- Leading participation in the [European X-ray laser XFEL](#).
- Construction of the [Centre for Free Electron Laser Studies](#) in cooperation with the Max-Planck Society and the University of Hamburg as a basis for German utilization of XFEL. Development and construction of new photon detectors.
- Operation of [PETRA III](#) the world's best radiation source for hard X-rays and focusing the DORIS programme on additional applications. Construction of a "Centre for Structure and Dynamics of Condensed Matter on the Nanoscale" as well as construction of the Engineering Materials Science Centre at DESY by GKSS for complementary utilization of photons and neutrons.

Photons - 2

- Further **expansion** of the user programme at **VUV-FEL FLASH** by increasing the experimental capabilities and by continuous further development of the installation with respect to improved stability and synchronization, seeding and the design of initial experiments.
- Expansion of a Centre for **Structural Biology** at DESY, together with the Research Field "Health".

- There will be an independent strategic review by the BMBF of the future of Synchrotron Light Sources in Germany and Europe (of importance for the future of DORIS).

DESY Requests for Major Investments (> 2.5 Mio. €)

- Major investments are normally treated independently from the strategic review. But ...
- Helmholtz major investments :
 - Proposals for major investments for 2009 ff had to be submitted in October 2007
 - **The ESC has at its last meeting taken note of each of the DESY proposals** (one, FLASH 2, was added later)
- The proposals were internationally reviewed
- The funds available in 2009 are 0.3 M€

- In view of the marginal budget in 2009 the steering committee of the Research Area decided not to start any of the proposed investments, but to **make them part of the strategic evaluation** in 2009

DESY Requests for Major Investments (> 2.5 Mio. €)

- Requests for 2009 and subsequent years
- Science induced investments:
 - Photon Science Nano-Lab
 - Detectors for FLASH and PETRA III
 - RF Systems
 - TIER2 Centre
 - **FLASH 2** (submitted later)
- Infrastructure investments:
 - Building 1 renovation

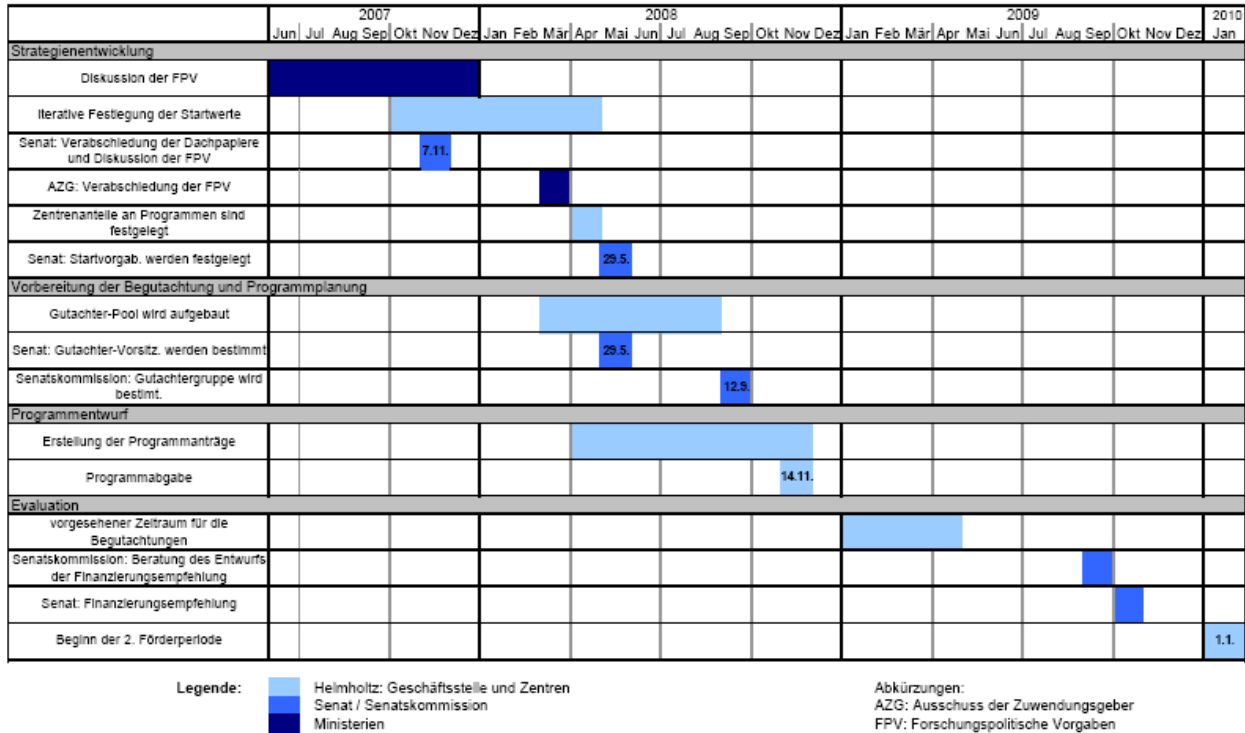
The Next Steps

The next steps in preparation of the evaluation are:

- Preparation of the **summaries** for each of the five programmes of the research area (**5 pages** each) - submitted
- Submission of the **full programmes** (~**30 pages** each plus addenda) by 14 November 2008.
- As each of the five programmes contains parts from more than one centre the DESY part of each programme has to be finalised already by mid October 2008.
- The evaluation of the five programmes by Helmholtz will take place in spring 2009.

Time Line

Zeitplan für die zweite Runde der Programmbegutachtungen - Energie, Schlüsseltechnologien, Struktur der Materie -



Preparation of the Evaluation and the Role of the ESC

In preparation for the external evaluation the DESY Directorate would like to ask the ESC for **guidance and help**.

We suggest that the ESC sets up **two groups** to evaluate both, the **present performance** of the laboratory and the content of the **proposed programmes**, for the following programmes in which DESY participates:

Particle and Astroparticle physics

Large scale facilities for research with Photons

Each of the two groups should be **chaired by a member of the ESC**, the groups should include **members** from the ESC, the more specialised advisory bodies of DESY (**PRC** for particle physics and **PSC** for photon research, plus a few **external members** appointed by the ESC in order to provide expertise not available otherwise).

Summary

- The definition of the DESY programs has started
- The next step is the detailed formulation of the programs, including the related budget
- The budget allocation (base budget and possible the major investment requests) will depend on the outcome of the evaluation
- The ESC is asked to serve as critical reviewer of the programs and their budget requests