Particle Physics in Germany
activities and perspectives

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Particle Physics in Germany

Grav. Waves

HESS, MAGIC

Bottom, Charm, Kaon

Nuclear Structure

Auger, Icecube ..

HERA, Tevatron,

CRESST,

LHC, ILC

Heavy Ions, Antiprotons

ν Oscillation, mass

Low energy Precision

Compass, Hermes, Hadrons

+ Accelerator, detector, (Grid) computing R&D

Pillars of Research

Within Germany:

- Universities
- Helmholtz Institutes
- Max Planck Institutes

International institutions (CERN, ...)

Situation in Germany
a federal state

Germany = 16 Länder/States

autonomous in education,

i.e. also universities

Essentially two sources of funding:
Länder + Federal government

Universities

28 Universities active in HEP,
mostly both theory+expt.
(approx. 40% of universities)

Funding:
Basic infrastructure funded by Länder
Typical basic resources
2-4 Professors + 6-10 scientists
(all with teaching, admin. load)
4-5 Technicians
Mechanical workshop,
some electronics, computing center
Participation in particle physics projects
requires additional „unique“ funding.
→ BMBF (federal)

Helmholtz Institutes

Institutes with large infrastructure for national users

Funded: 90% Fed. Gov.
10% Länder

Particle physics
(+ other science) at
DESY (Hamburg/Zeuthen)
GSI (Darmstadt)
FZ Karlsruhe

Helmholtz Institutes

DESY:	physics at highest energy accelerators
	(HERA; ATLAS, CMS)
	ILC
	Neutrino and Gamma Astroparticle Physics
GSI:	Heavy Ion (Alice)
	FAIR
FZ Karlsruhe:	Tier 1 for LHC - Grid
	Neutrino physics (KATRIN)
	Cosmic rays

- All contribute significantly to Grid Computing
- All substantial R&D on accelerator physics

Max Planck Institutes

Pure research

Funded:

- 50% Federal Gov.
- 50% Länder

HEP:

Heisenberg (Munich)

ATLAS, ILC, non-accelerator, Astroparticle,

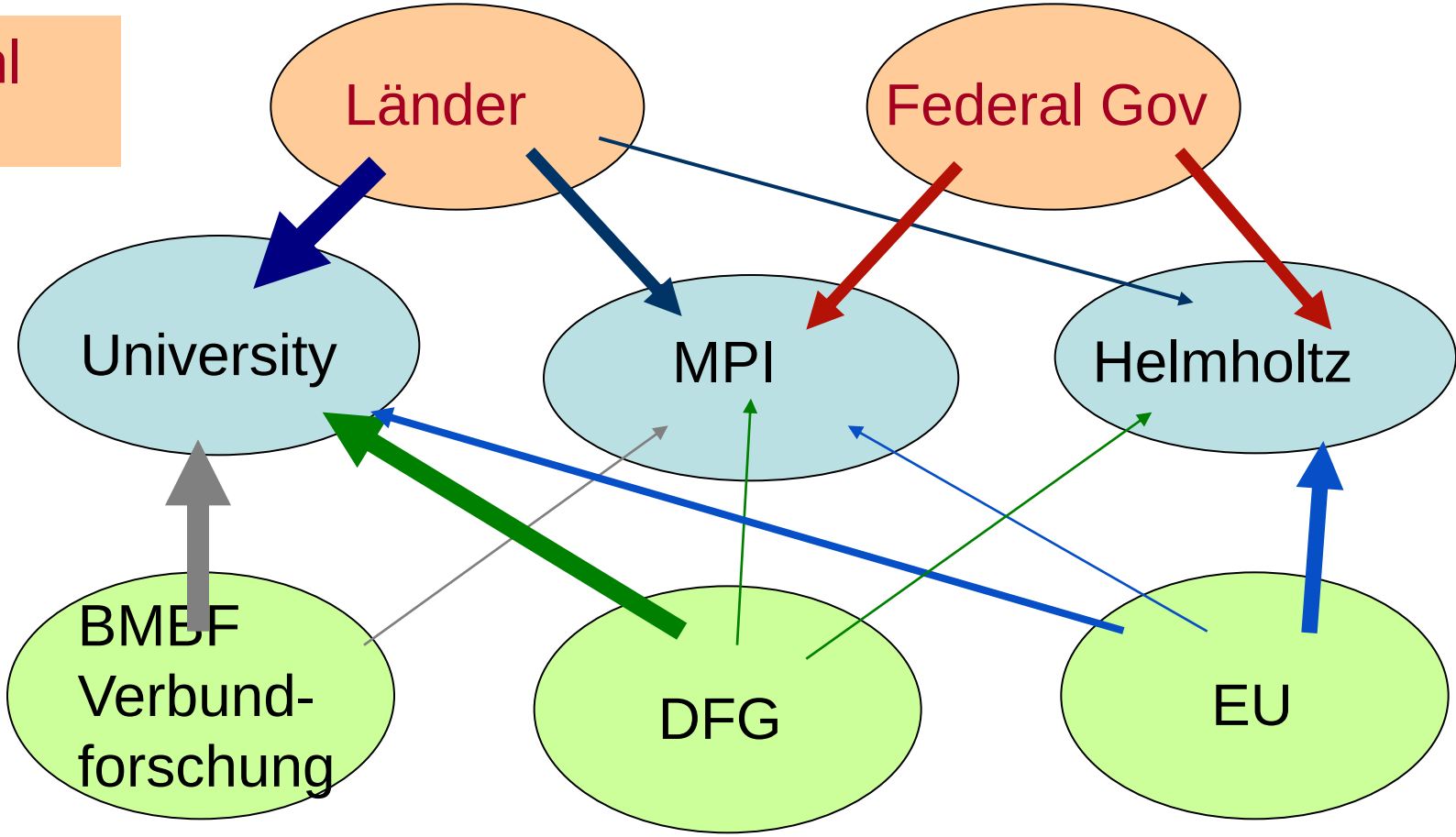
Heidelberg

LHCb, Neutrino, Astroparticle

Funding structure

Institutional funding

Project funding



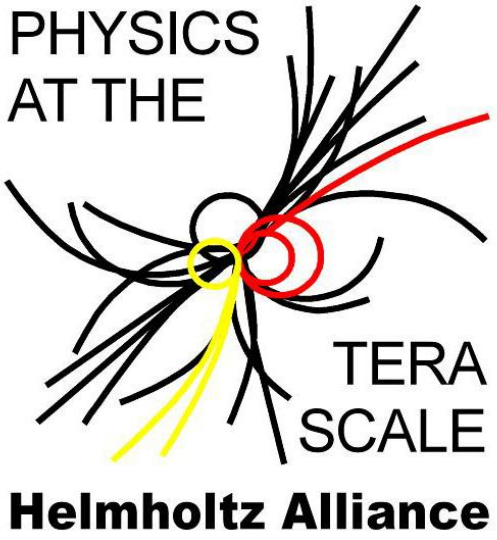
Helmholtz Alliance

Since July 2007:
Helmholtz Alliance ‚Physics @ the Terascale'

Aiming at a sustainable new structure for LHC and ILC physics

Crossing boundaries between experiments and between institutions to generate common framework for research
25 M€ during the next 5 years

Combines specific roles and expertise of
DESY, FZ Karlsruhe, 17 Universities and MPI (M)



e.g. creating a virtual detector laboratory
- VLSI & Electronics
- Support Sensor Design & Characterization
- Detectors Systems Support

Number of researchers

2009 ECFA Survey:

Was asking for Fractionial Research (FRA)

PhD-Seniors	347
PostDocs	536
PhD Students	714
Engineers	151

Experiment/Theory

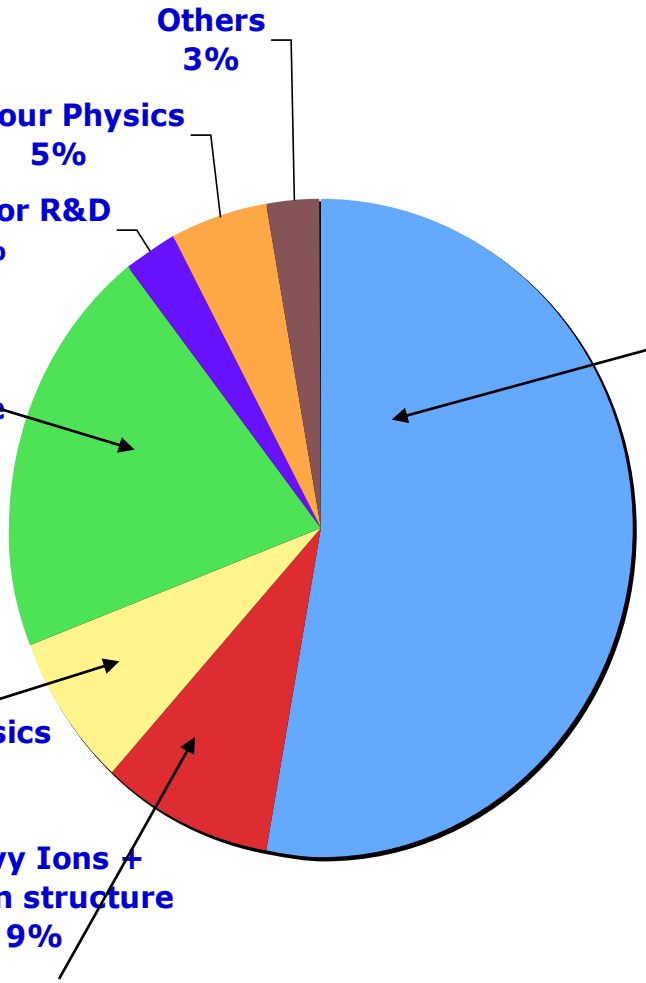
approx. 2.5:1

Number is higher!

e.g. university engineer working in HEP for 50% of his time counts only 0.5

Fields of Research

2006



HESS
MAGIC
Auger
IceCube
CTA
…

Mainly LHC
ATLAS, CMS,
LHCb
- upgrades

HERA,
Tevatron
B-Factories
(BABAR + BelleII)
ILC
…..

Double Chooz
OPERA
KATRIN
…

Incl. ALICE

DESY

Changing role of DESY

Now: no operating accelerator for particle physics
accellerators at DESY $\rightarrow$ phton science

HERA data still being analyzed

Still vital for particle physics in Germany

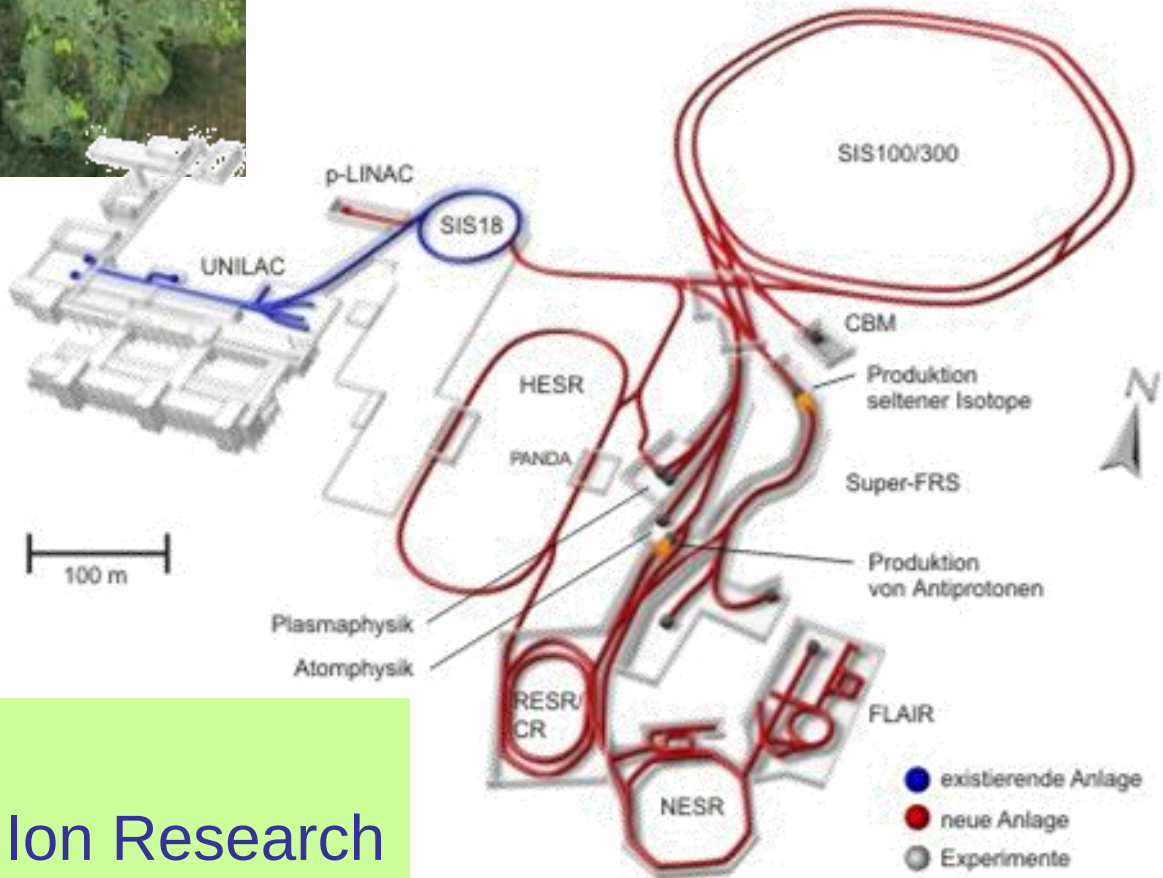
- central facilities
  - (e.g. Tier-2 Center for ATLAS, CMS
- National Analysis Facility
- Heart of the Helmholtz-Alliance

Foundation: 4.10.2010

Mostly not particle physics

Complex detectors required though

GSI & FAIR



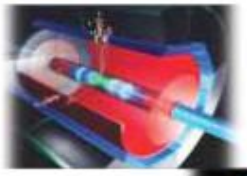
FAIR

Facility for Antiproton and Ion Research

Perspectives

Komitee für
ElementarTeilchenphysik
KET

Particle Physics in Germany



Status and Perspectives

2002

New strategy document in preparation

Conclusions

Strong research in particle physics
Strong focus on LHC programme (incl. Upgrade)

DESY changed profile

Somewhat complicated structure/funding regime

Participation in all areas –

- Detector R&D and construction
- Electronics
- Data Analysis
- Computing
- Accelerator Physics

Future strategy in preparation