

# News from DESY.

Joachim Mnich

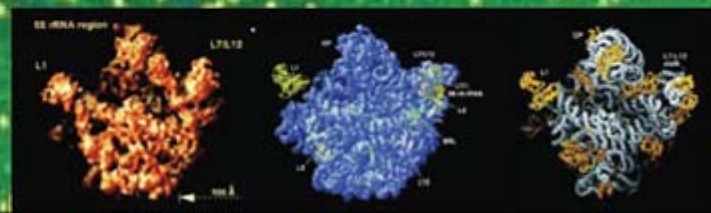
Plenary ECFA Meeting  
CERN, November 2009



## 1. News.

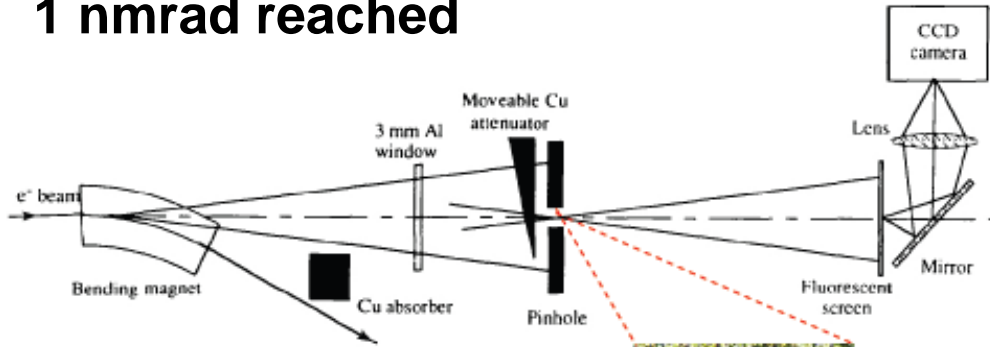
# Nobel Prize Chemistry 2009.

- **Ada Yonath** (together with V. Ramakrishnan und T. Steitz)
- Pioneered Ribosome crystallography
- 1986-2004 Head of Max-Planck group „Ribosomstruktur“ at **DESY**
- Key x-ray experiments at **DORIS /BWS**



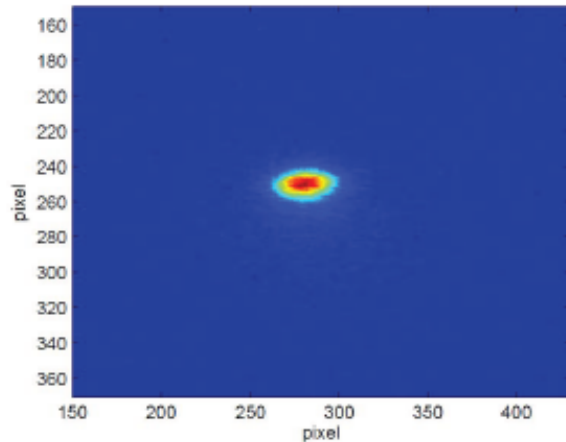
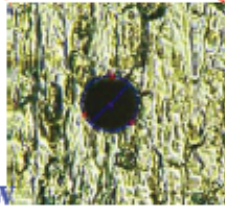
# PETRA III

- > Design emittance of 1 nmrad reached



PETRA III pinhole camera:

Ø 20 µm hole in 500 µm thick W plate



Horizontal e-beam size  
43µm

→  $\epsilon_x = 0.95 \pm 0.10$  nm

All damping wigglers installed,  
expect:

$\epsilon_x: 4.5 \rightarrow 1$  nmrad



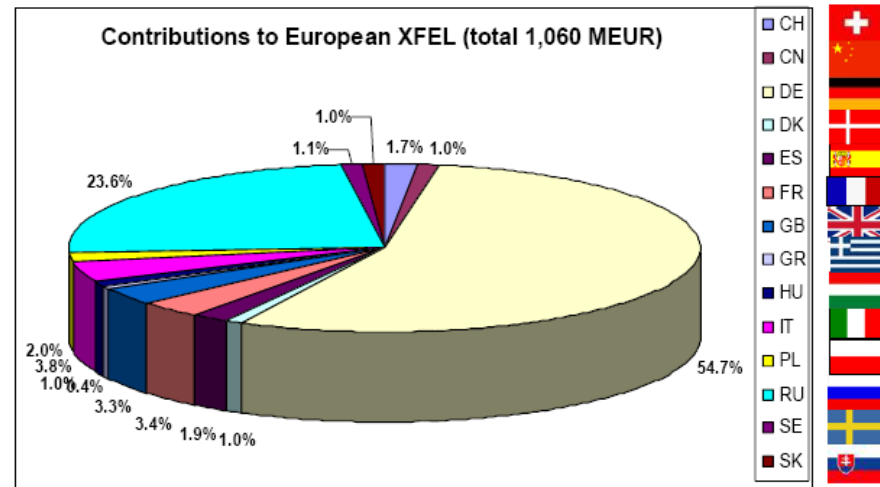
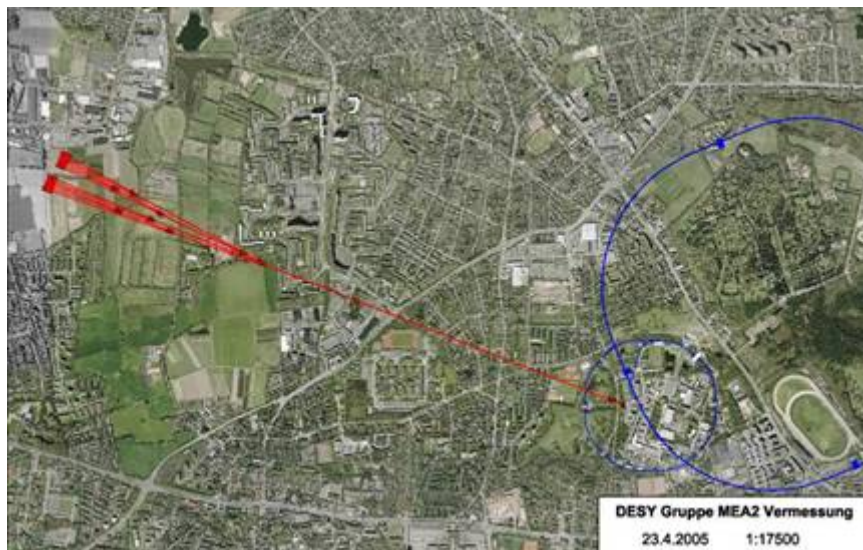
- > 89 mA current reached  
= 89% of design value

# Inauguration PETRA II

16.11.2009



# Progress European XFEL



> **Civil construction, e.g. injector complex on DESY site**



# Foundation of the European XFEL Company

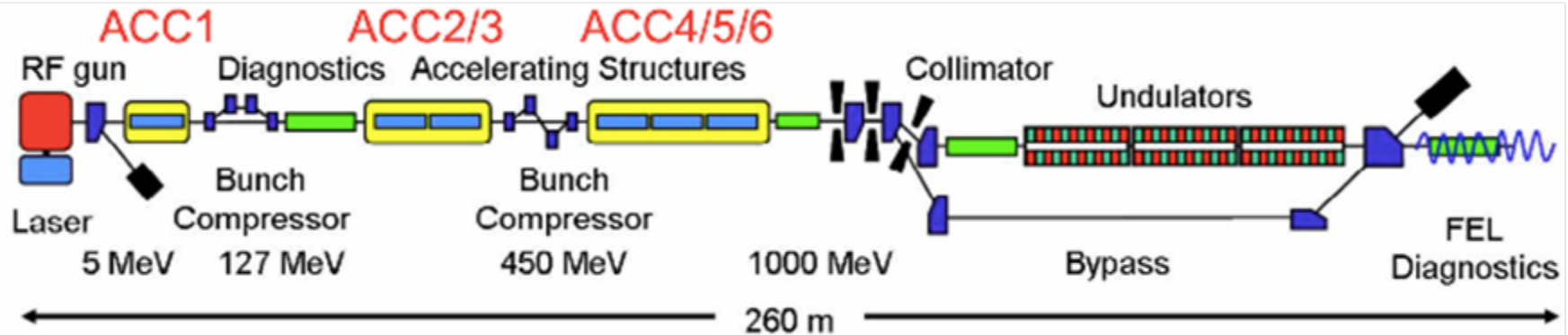
- > **21. – 23.9.2009**  
**Translator conference**



- > **28.9.2009**  
**Preliminary creation of European XFEL Company (DESY sole shareholder)**
- > **30.11.2009**  
**Signing of Convention (CH, DK, ES, RU, SE, SK)**

# FLASH and the ILC

## > FLASH 9 mA Experiment



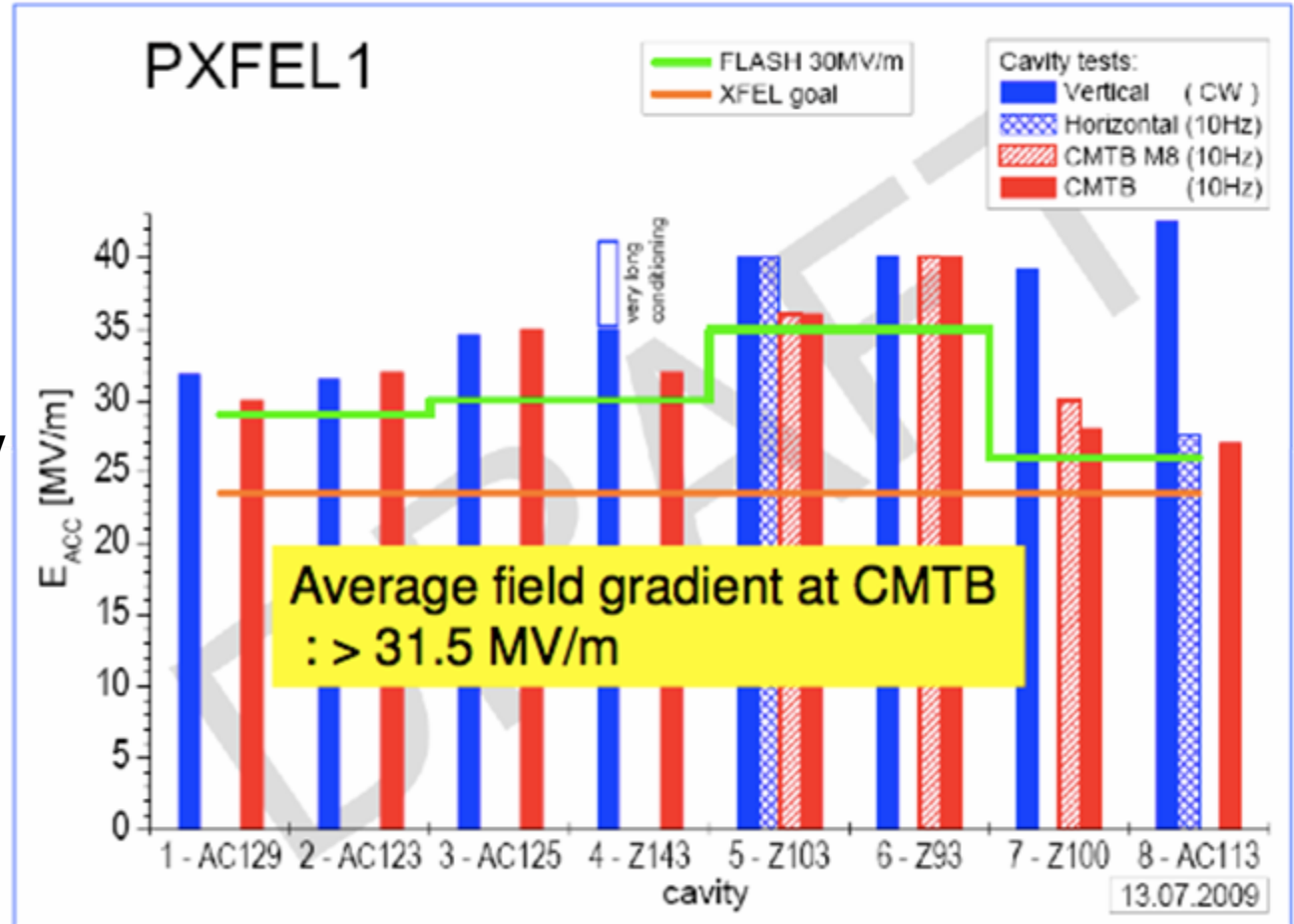
- > As a user machine FLASH is typically running with a few bunches only
- > ILC-like operations mode after preparation (power upgrade to the dump, etc.)

- FLASH ran with more than 2200 bunches of 3nC @ 3 MHz (for short periods)

		XFEL	ILC	FLASH design	9mA studies
Bunch charge	nC	1	3.2	1	3
# bunches		3250	2625	7200'	2400
Pulse length	μs	650	970	800	800
Current	mA	5	9	9	9

↑  
comparable requirements

- > DESY PXFEL1 module in CMTB
  - First module to exceed 31.5 MV/m
- > Cryomodule cold mass contributed by IHEP (Beijing) XFEL prototype
- > To be installed in FLASH energy upgrade to 1.2 GeV





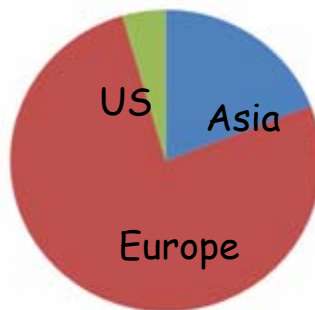
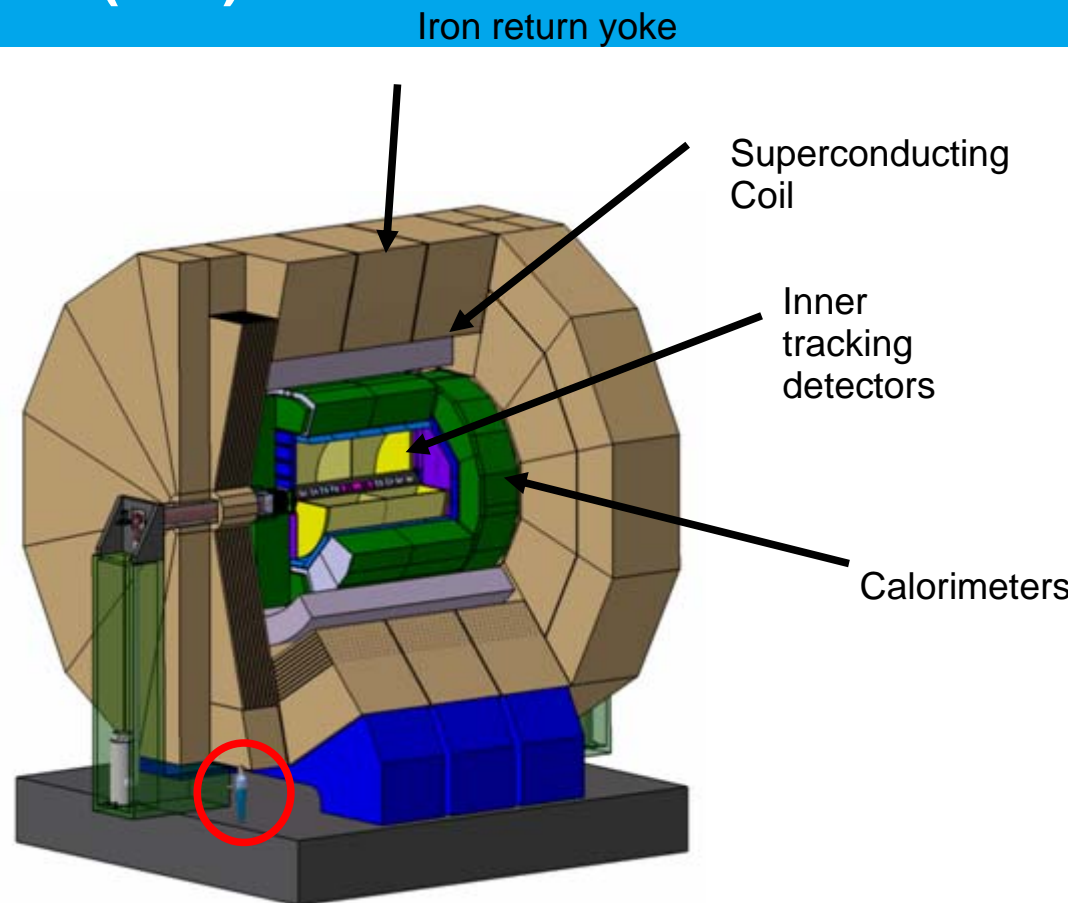
# International Linear Collider (ILC)

## > ILD detector concept

- validated by International Detector Advisory Group (IDAG)
- together with SiD concept



698 signatories  
from 149 countries  
DESY leadership position



## First H1-ZEUS Papers and more...

**NEW for this PRC:** first three H1-ZEUS papers

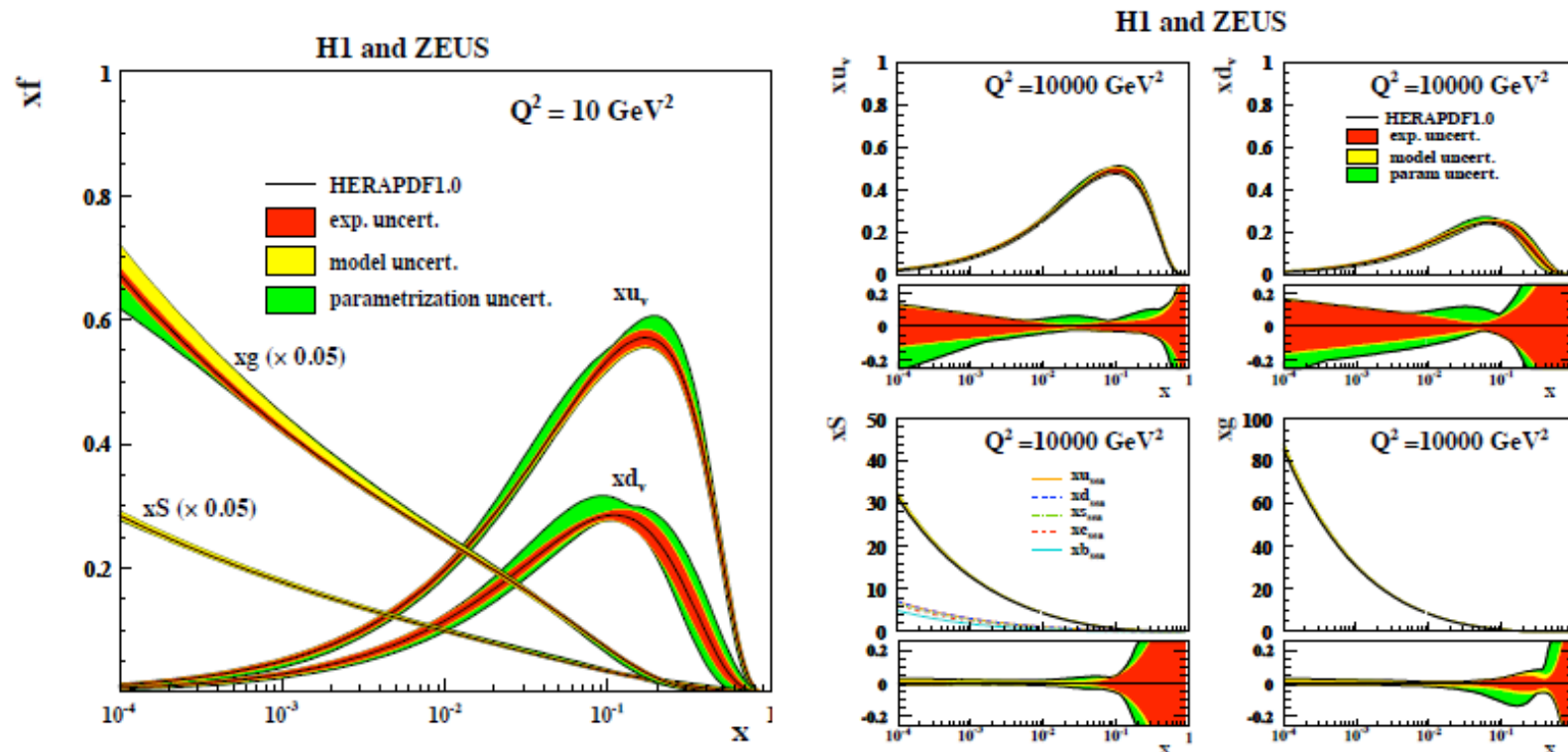
1. “Multi-leptons with High-Transverse Momentum at HERA”  
- arXiv:0907.3627 and JHEP10(2009)013 **First joint paper**
2. “Events with an Isolated lepton and Missing Transverse Momentum and Measurement of W production at HERA”  
- arXiv:0911.0858, submitted to JHEP
3. “Combined Measurement and QCD Analysis of the inclusive ep Scattering Cross-Sections at HERA”  
- arXiv:0911.0884, submitted to JHEP

**NEW for this PRC :** Preliminary H1-ZEUS combined  $F_2^{(\text{charm})}$  results

Will cover here the inclusive DIS cross sections and  $F_2^{(\text{charm})}$  results  
(see D. South presentation for the Multi-lepton and Isolated lepton papers)



## HERAPDF1.0

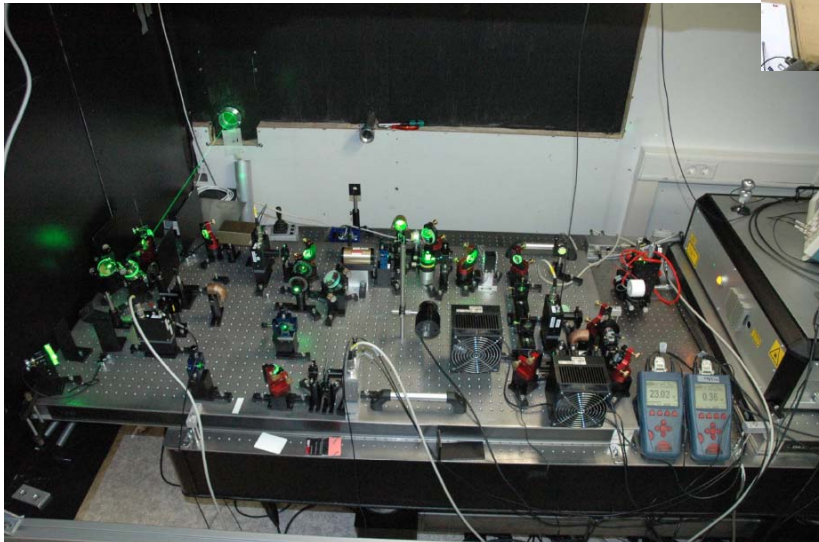
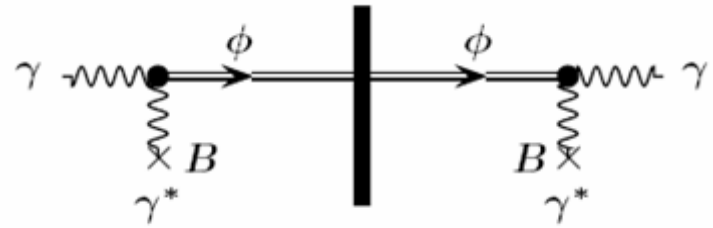


- Detailed study of the PDFs uncertainties
- Sea and Gluon: much increased precision
- LHC Phenomenology

# ALPS: Axion-like Particle Search

## > Collaboration of

- DESY
- MPI for Gravitational Physics Hannover
- Leibniz University Hannover
- Laserzentrum Hannover
- Hamburger Sternwarte

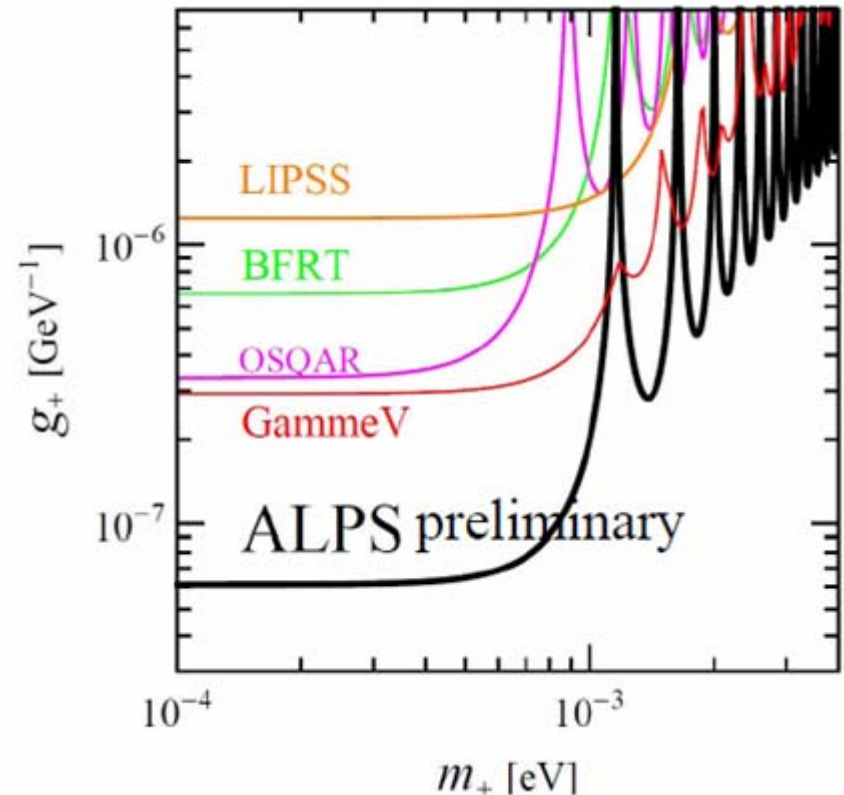
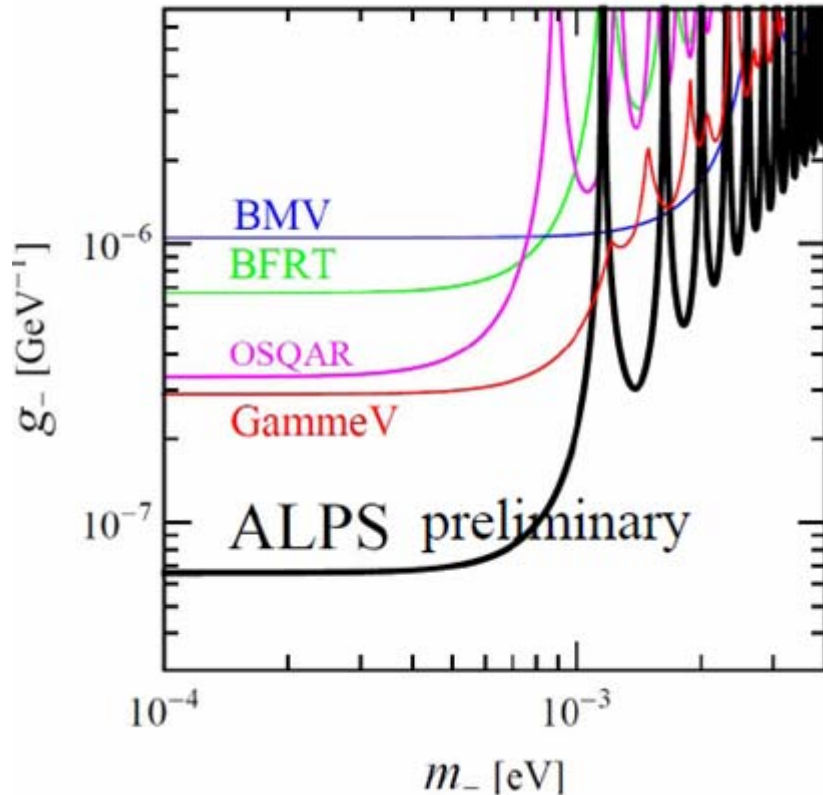


## > Huge progress in sensitivity e.g. laser power

- 3 W in 2007
- 1300 W in 2009  
achieved by resonant power  
build-up

# ALPS New Result

## > Results in vacuum:

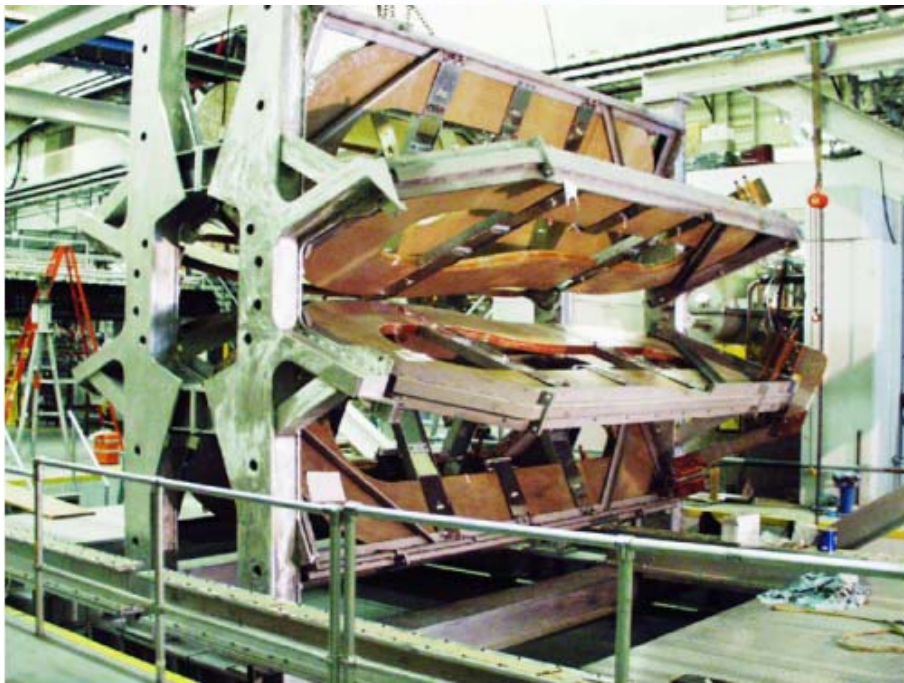


## > Additional results in thin gas to fill resonance gaps

## > **ALPS is most sensitive WISP experiment** (Weakly Interacting Sub-eV Particle)

# OLYMPUS Experiment at DORIS

- > **Measurement of inelastic cross section ratio  $e+p$  vs  $e-p$**
- > **Use BLAST detector at Bates laboratory, MIT**



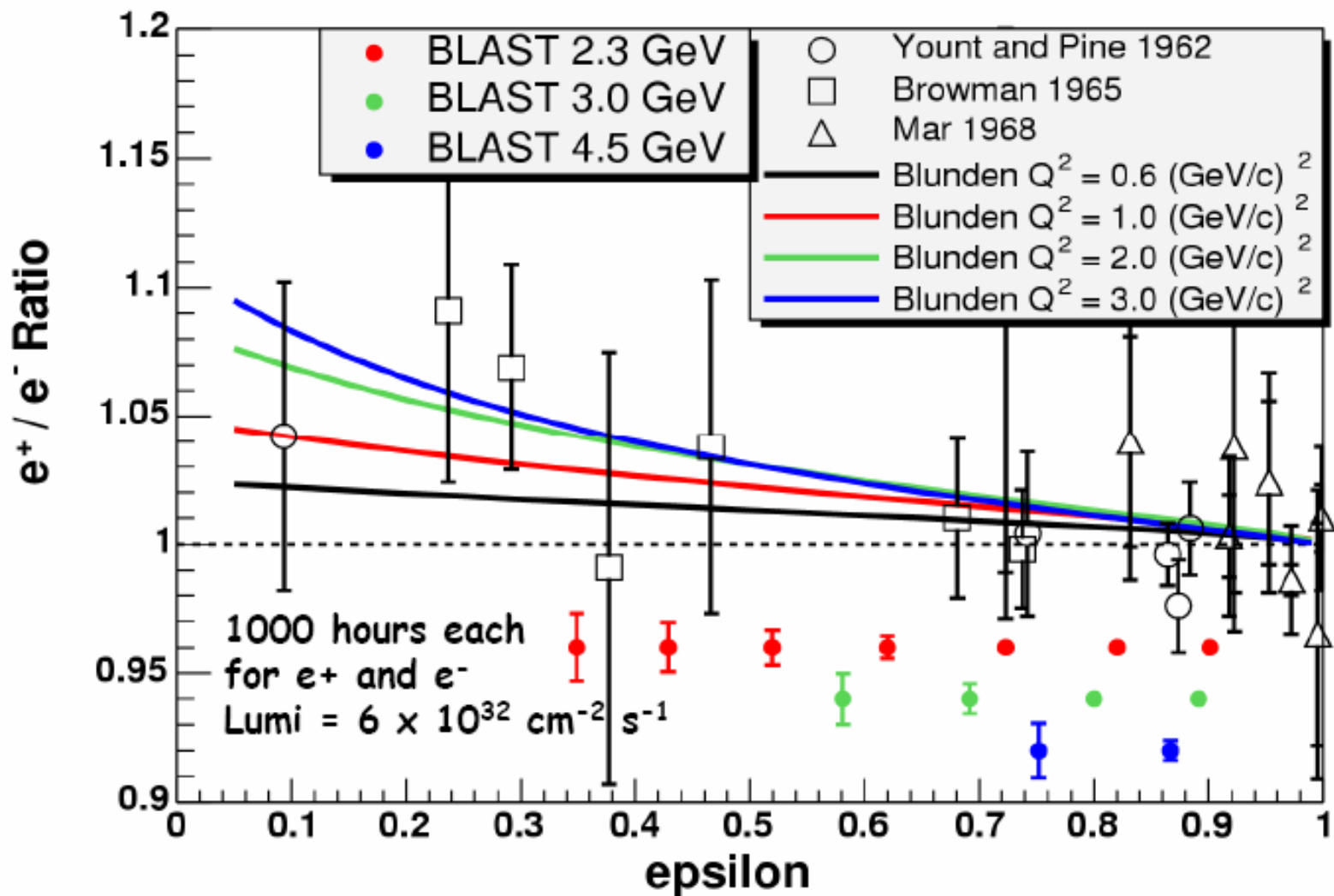
## OLYMPUS Technical Design Report DRAFT

The OLYMPUS Collaboration  
<http://web.mit.edu/olympus/>

Arizona State University, USA  
DESY, Hamburg, Germany  
Hampton University, USA  
INFN, Bari, Italy  
INFN, Ferrara, Italy  
INFN, Rome, Italy  
Massachusetts Institute of Technology, USA  
St. Petersburg Nuclear Physics Institute, Russia  
Universität Bonn, Germany  
University of Colorado, USA  
Universität Erlangen-Nürnberg, Germany  
University of Glasgow, United Kingdom  
University of Kentucky, USA  
Universität Mainz, Germany  
University of New Hampshire, USA  
Yerevan Physics Institute, Armenia



# OLYMPUS Projected Results



# OLYMPUS Schedule

- > **Nov 2009: DOE approved funding for US groups**
- > **Spring 2010: ship and assemble BLAST/OLYMPUS detector and OLYMPUS target**
- > **Winter 2010/11: Modify DORIS beam-line**
- > **2011: commissioning of OLYMPUS**
  - **Parasitic mode and some dedicated shifts during service weeks**
- > **2012: two data taking periods:**
  - **1 month at the beginning**
  - **2 months at the end**
  
- > **DORIS will be shut down end of 2012**





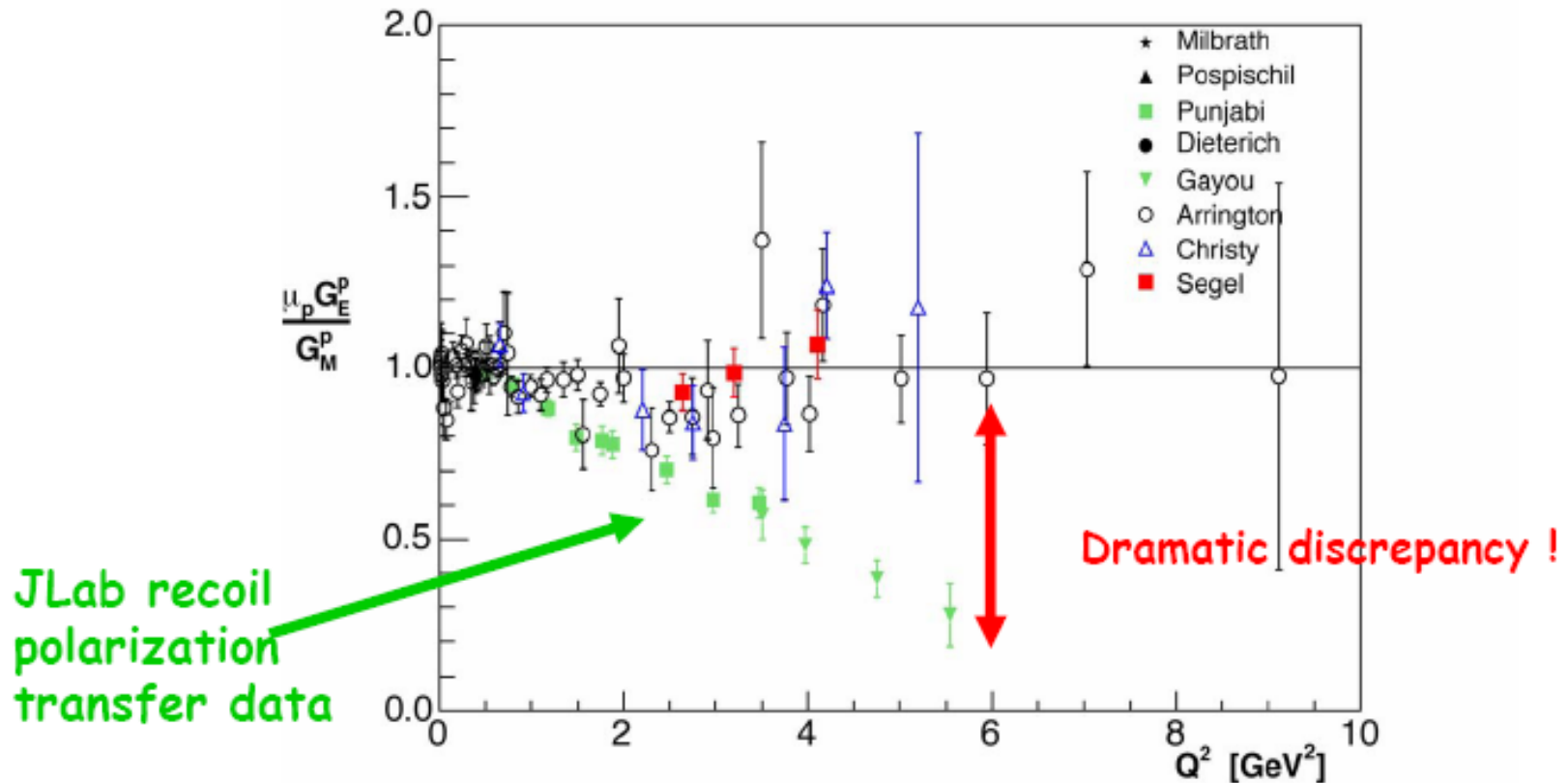
## > DESY congratulates CERN to the successful start-up of LHC



# The End



# Rosenbluth and Recoil Polarization



- All Rosenbluth data from SLAC and Jlab in agreement.
- Dramatic discrepancy between Rosenbluth and recoil polarization technique
- Discrepancy explained as effect of two photon exchange (TPE)

# Helmholtz Alliance „Physics at the Terascale“

- > 3<sup>rd</sup> Annual Meeting
- > 315 participants
  - 120 „new Terascalers“



- > Mid-term review next week“

Helmholtz Alliance  
**PHYSICS AT THE TERASCALE**



Deutscher Elektronen Synchrotron DESY \*\*\* Forschungszentrum Karlsruhe GmbH \*\*\* Max-Planck-Institut für Physik München \*\*\* Rheinisch-Westfälische Technische Hochschule Aachen  
\*\*\* Humboldt-Universität Berlin \*\*\* Rheinische Friedrich-Wilhelms-Universität Bonn \*\*\* Universität Dortmund \*\*\* Technische Universität Dresden \*\*\* Albert-Ludwigs-Universität  
Freiburg \*\*\* Justus-Liebig-Universität Gießen \*\*\* Georg-August-Universität Göttingen \*\*\* Universität Hamburg \*\*\* Universität Heidelberg \*\*\* Universität Karlsruhe \*\*\* Johannes  
Kepler-Universität Mainz \*\*\* Ludwig-Maximilians-Universität München \*\*\* Universität Regensburg \*\*\* Universität Rostock \*\*\* Universität Siegen \*\*\* Julius-Maximilians-Universität  
Würzburg \*\*\* Bergische Universität Wuppertal \*\*\*

## 3<sup>rd</sup> Annual Workshop

11 - 13 November 2009  
DESY, Hamburg Site

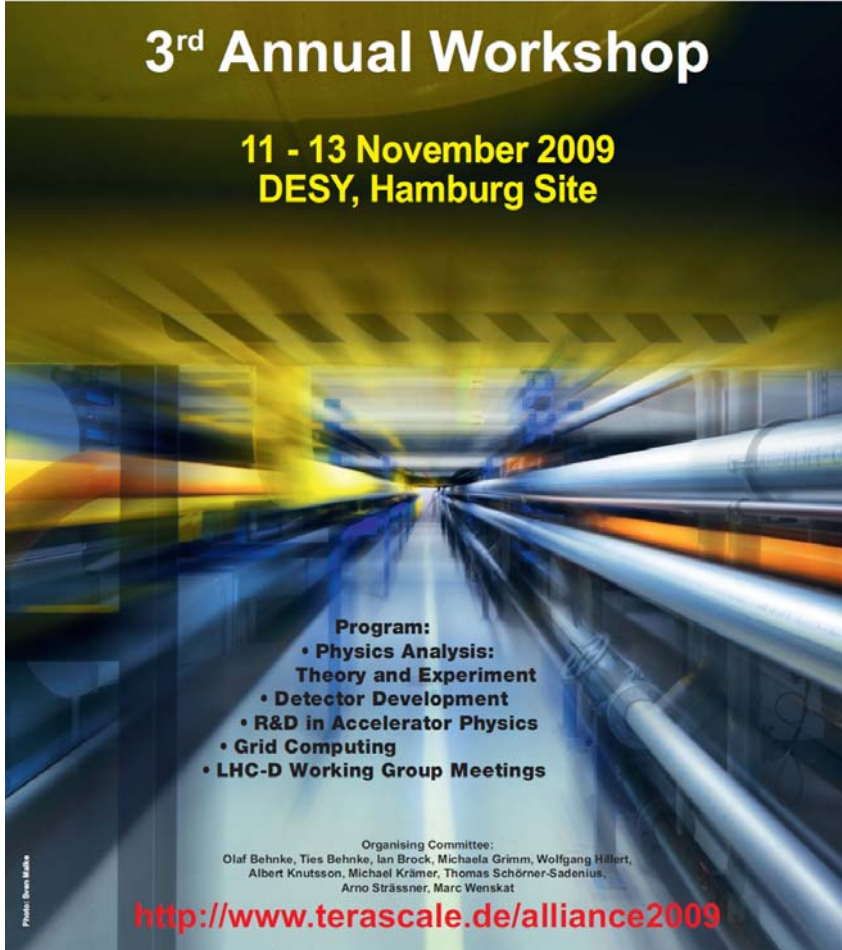
Program:

- Physics Analysis: Theory and Experiment
- Detector Development
- R&D in Accelerator Physics
- Grid Computing
- LHC-D Working Group Meetings

Organising Committee:  
Olaf Behnke, Ties Behnke, Ian Brock, Michaela Grimm, Wolfgang Hillert,  
Albert Knutsson, Michael Krämer, Thomas Schönher-Sadenius,  
Arno Strässner, Marc Wenskat

<http://www.terascale.de/alliance2009>

Photo: Sven Müller

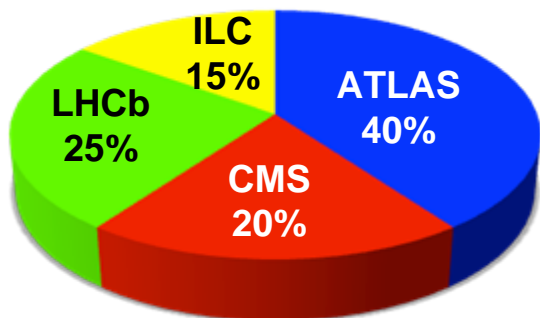


# Alliance Highlights

## > Example: National Analysis Facility (NAF)

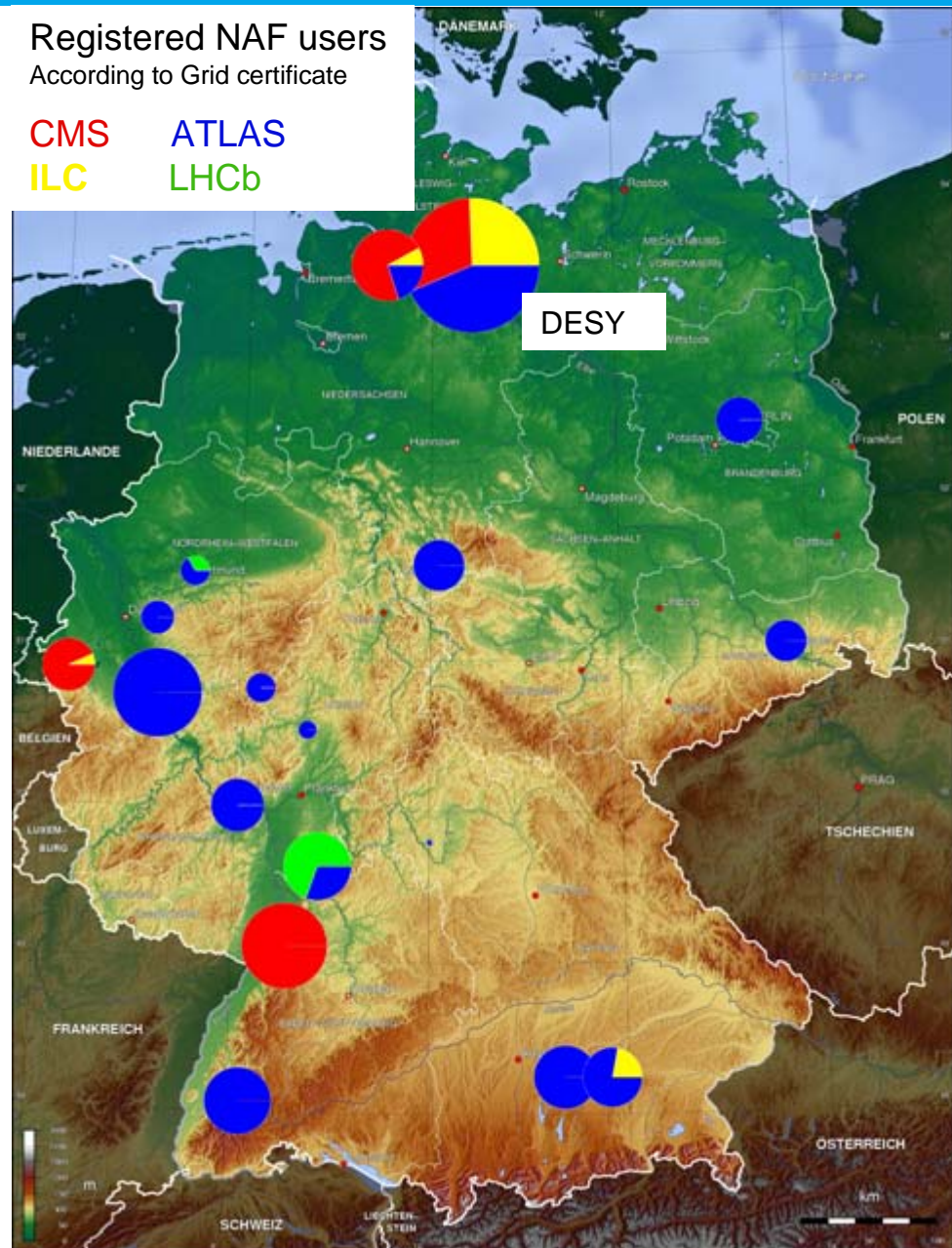
- Good utilization  
~ 80% for interactive resources
- ~ 350 registered users,  
~ 75% non-DESY

Local batch usage:  
October 2009



Registered NAF users  
According to Grid certificate

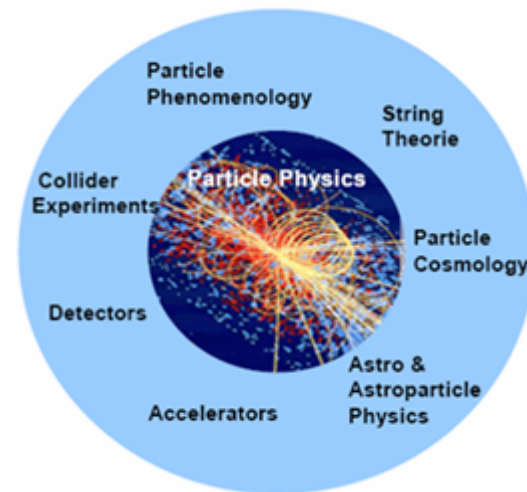
CMS ATLAS  
ILC LHCb



# Hamburg Excellence Initiative

- > **Local political initiative to increase chances of Hamburg (university + research labs) to succeed in upcoming federal initiative**
- > **Particle and astroparticle physics: Connecting Particles with the Cosmos**
- > **Hamburg University + DESY**
- > **Broad scope, with particular items put forward**
  - **Dark Matter: connecting astroparticle and e.g. LHC physics**
  - **Accelerator science: exploiting XFEL/ILC synergy, novel accelerator techniques**
  - **Common detector lab (in framework of Alliance)**
- > **Proposal approved in July**

Connecting Particles with the Cosmos



- > **Kick-off event 3./4.11.2009**

