

News from DESY.

Joachim Mnich

Plenary ECFA
CERN, November 2010



Beschleuniger | Forschung mit Photonen | Teilchenphysik

Deutsches Elektronen-Synchrotron
Ein Forschungszentrum der Helmholtz-Gemeinschaft



> Stern-Gerlach-Medaille 2011

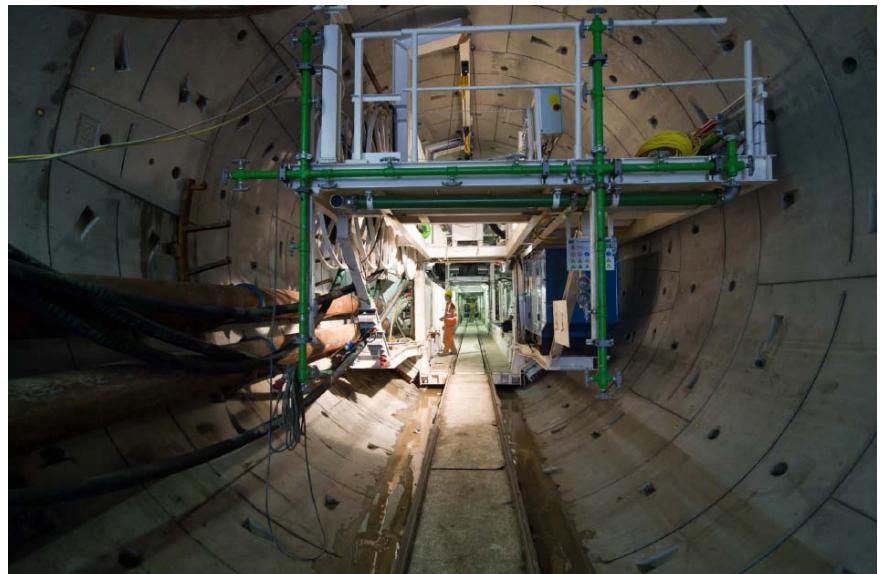
Günter Wolf (DESY)

Günter Wolf erhält die Stern-Gerlach-Medallie für seine Arbeiten auf dem Gebiet der Hochenergiephysik. Er hat die Entwicklung des Gebiets und die Etablierung des Standardmodells der Elementarteilchen durch wichtige Arbeiten und Entdeckungen nachhaltig geprägt.

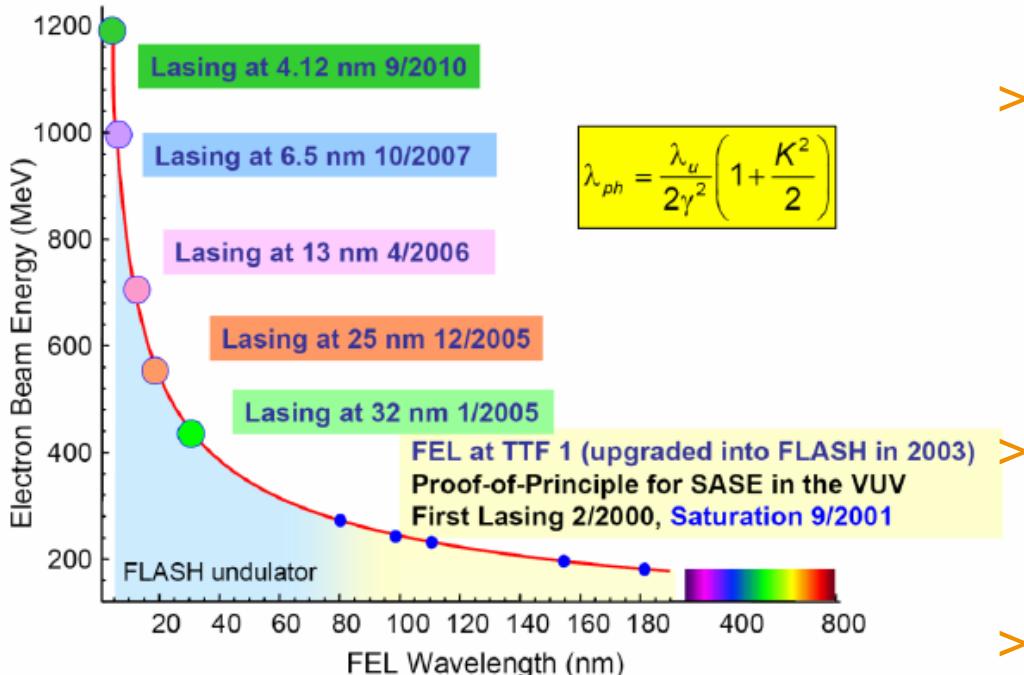
- > Most prestigious German prize in experimental physics
- > Awarded by the German physical society (DPG)



Status XFEL



FLASH



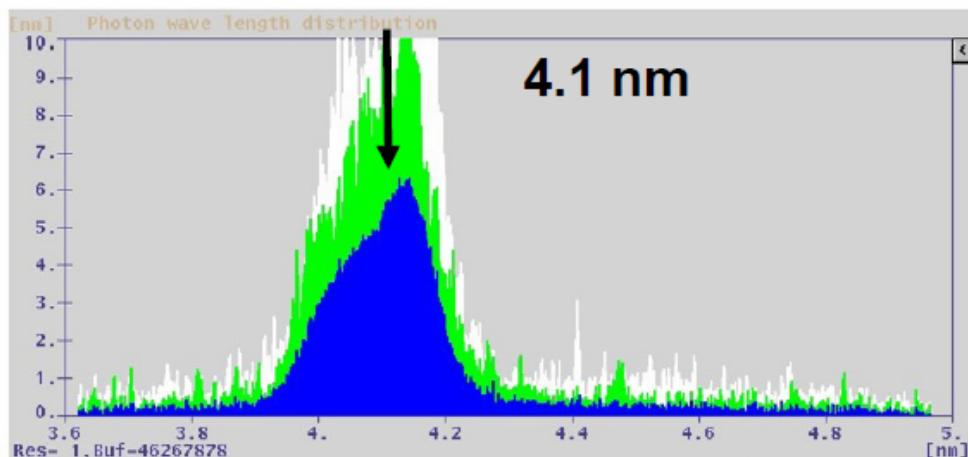
> FLASH upgrade:

- Beam energy 1.2 GeV
new acc. module with <31.5 MV/m>
- 3rd harmonic RF system
smoother tuning of FEL process

4.1 nm (water window)

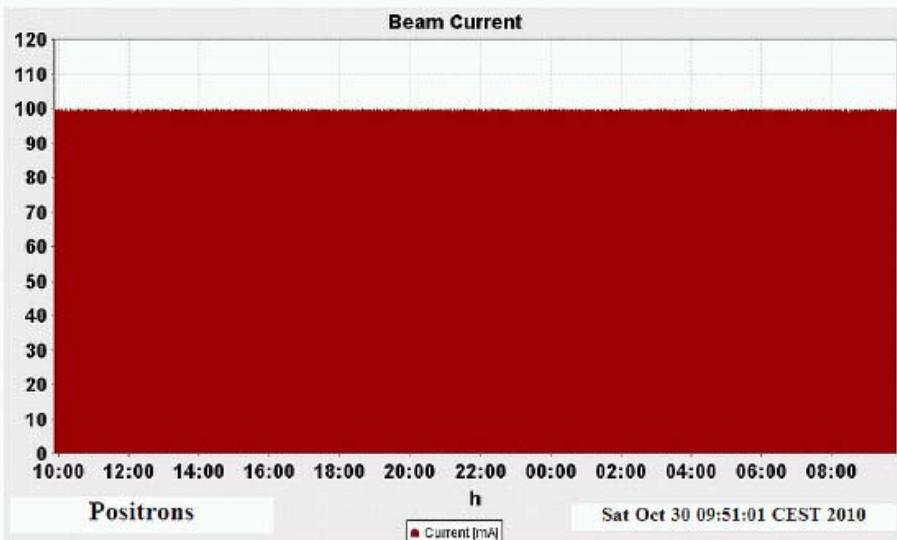
> FLASH II project

- Doubling # of beam lines
- Project approved and financed by Helmholtz



> Regular user operation since mid 2010

PETRA Energy: 6.084 GeV Lifetime: 5.58 h Current: 99.29 mA



Und.	Gap	Status
PU02	202.00	Grey
PU03	11.23	Green
PU04	147.04	Grey
PU05	217.00	Green
PU06	217.00	Green
PU07	11.31	Green
PU08	20.85	Green
PU09	16.14	Green
PU10	16.23	Green
PU11	211.00	Grey
PU12	217.00	Green
PU14	215.72	Green

All design specifications reached

Availability ~95%

Number of Bunches: 240 **Mean Vacuum Pressure:** 1.441E-08 mbar

Orbit Control: On **Top-Up Operation:** 0.34 mA (RMS)

[User Operations->Experiments](#)

User Run

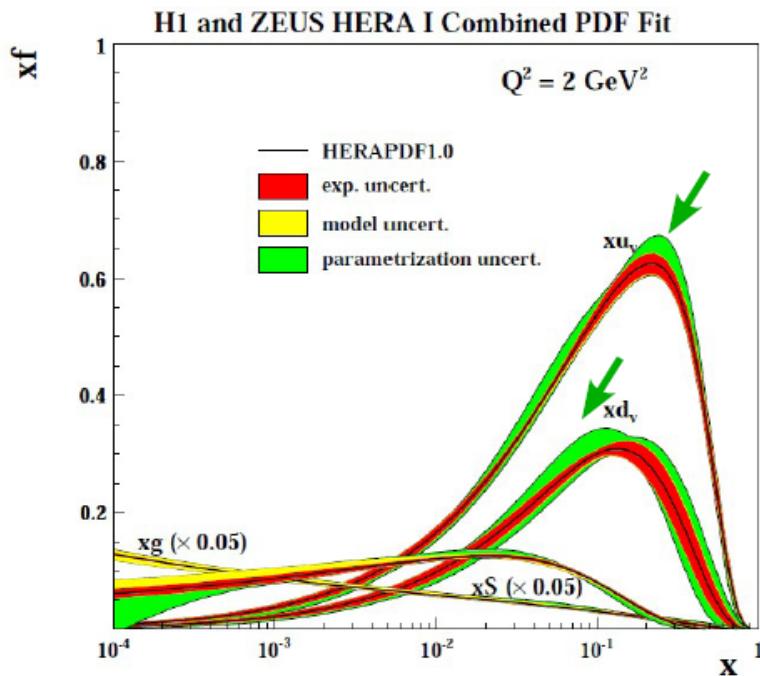
Analysis of HERA Data

- HERA II
- Combination of experiments

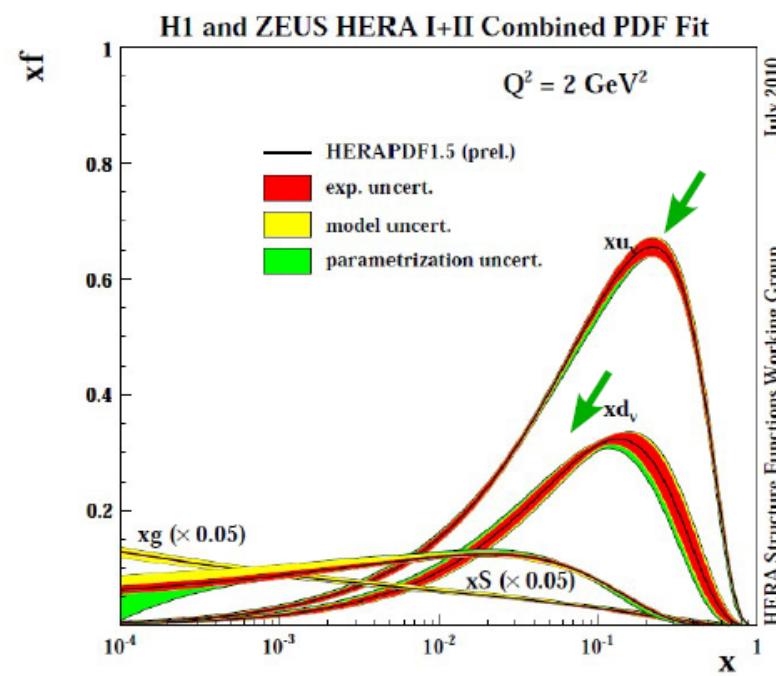
≈ 40 more papers per experiment (H1/ZEUS)



HERAPDF1.0

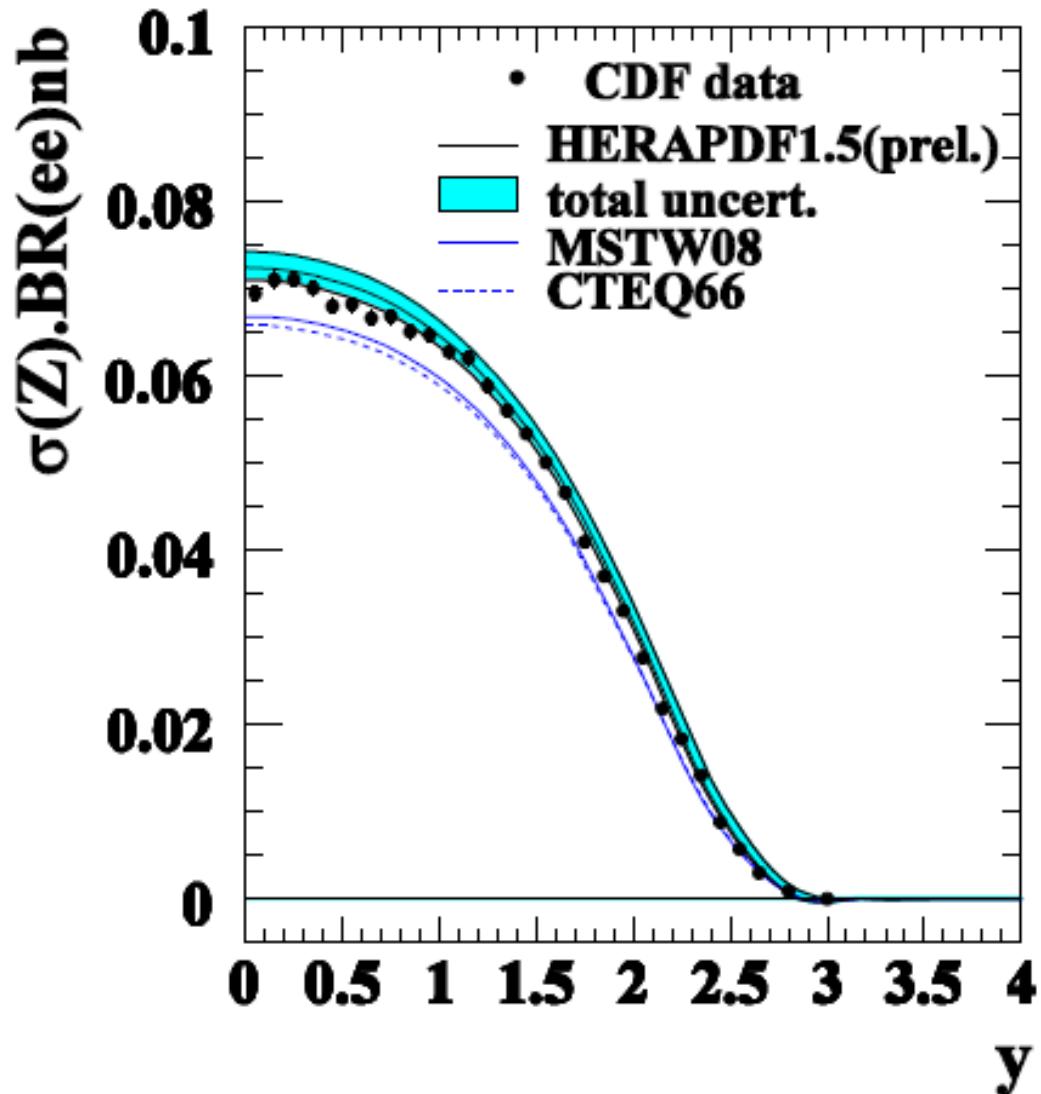


HERAPDF1.5

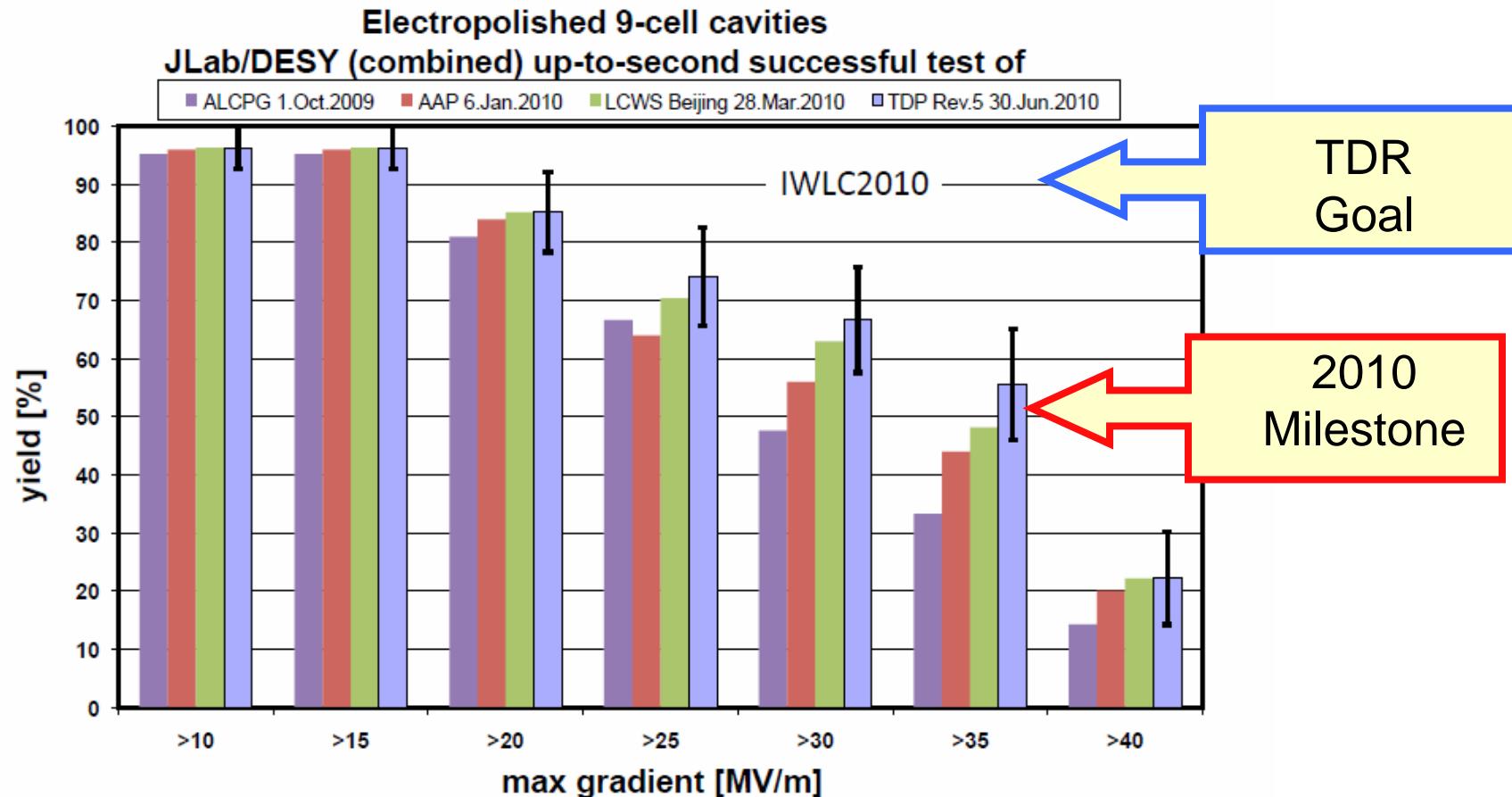


Impact on Hadron Colliders

- > Example:
Z production at the Tevatron
- > HERAPDF1.5 accurately
describe CDF data
- > PDF4LHC workshop
 - next meeting at DESY
November 29

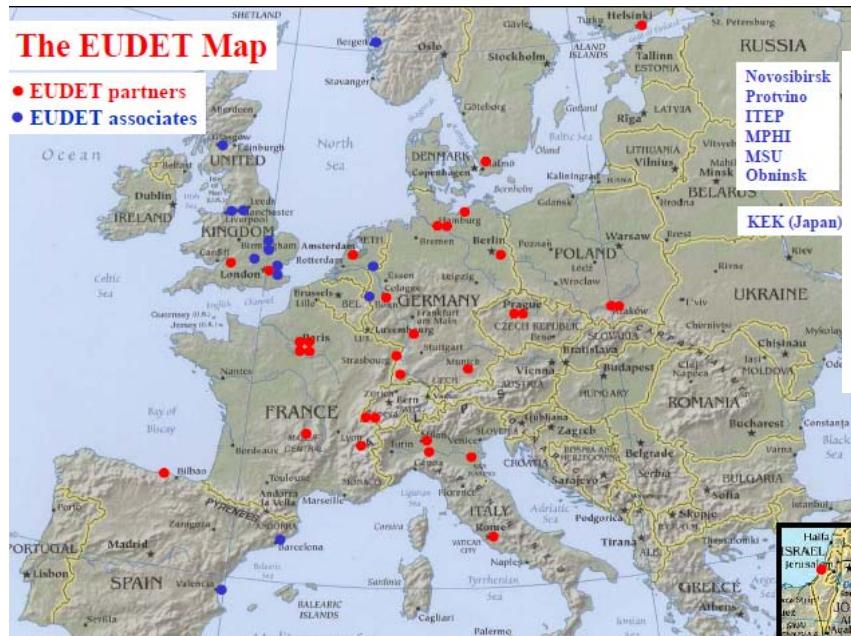


Cavity gradient milestone achieved

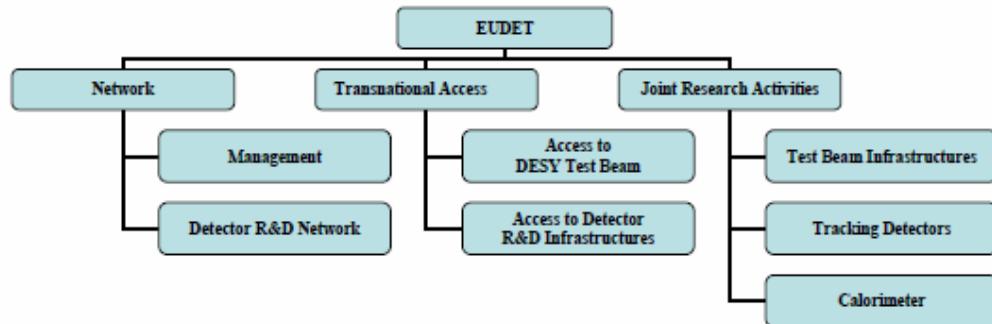


EUDET project 2006-2010:

- collaboration in Europe & beyond
- > 30 institutes



- well defined structure



- plus additional funds
7 M€ in total

- > All goals achieved
- > EUDET is a big success

Helmholtz-Alliance „Physics at the Terascale“

- > 3 years of building up new structures is paying off:
- > Virtual detector lab → sLHC
- > NAF and distributed Tier-2 → LHC analysis
- > Analysis Centre
 - Schools & workshops
 - Projects on statistics, Monte Carlo, phenomenology, SUSY/BSM fitting, ...

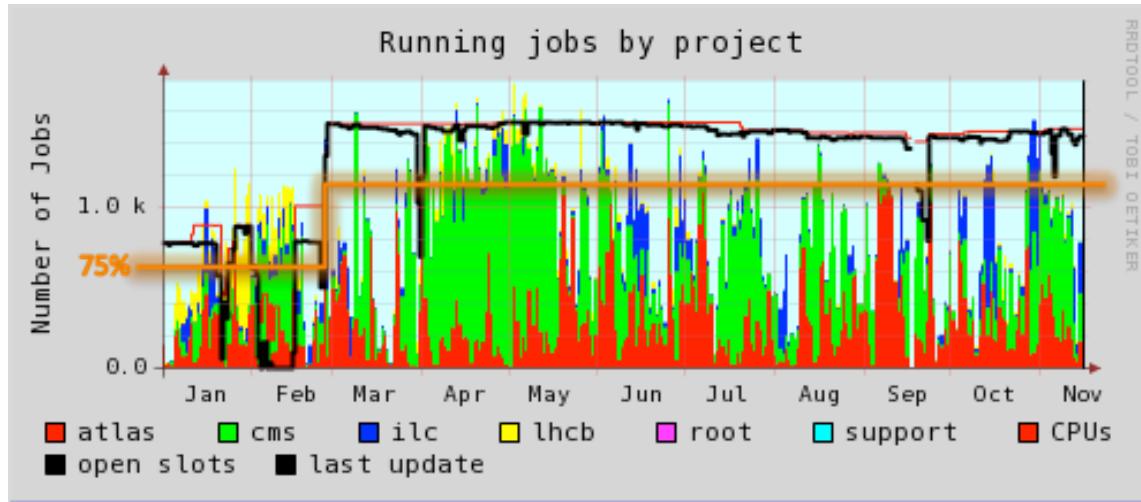
The advertisement features a blue header with the text "Helmholtz Alliance" and "PHYSICS AT THE TERASCALE". Below the header is a list of participating institutions. The main title "Analysis Centre Schools and Workshops 2011" is prominently displayed. Several white arrows point downwards from the top towards the bottom, each containing information about a specific workshop. The workshops listed are:

- Single-Top Workshop
14-15 February 2011
DESY, Hamburg
terascale.de/singletop2011
- Introductory School to the Terascale
21-23 February 2011
DESY, Hamburg
terascale.de/intro2011
- Monte Carlo School 2011
14-17 March 2011
DESY, Hamburg
terascale.de/mc2011
- Computer Algebra & Particle Physics 2011
20-25 March 2011, DESY, Zeuthen
terascale.de/capp2011
- School on Statistics 2011
21-24 March 2011, DESY, Hamburg
terascale.de/statistics2011
- Geant4 Training
10-13 May 2011
DESY, Zeuthen
terascale.de/geant2011
- Standard Model Benchmark Processes at the LHC
15-17 June 2011
DESY, Zeuthen
terascale.de/lmcandies2011

http://www.terascale.de/schools_and_workshops

Helmholtz Alliance “Physics at the Terascale”

> Example: National Analysis Facility (NAF)



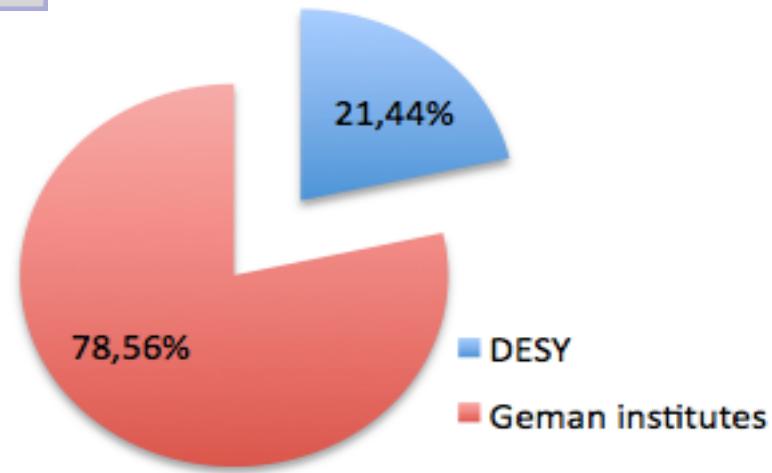
Need to upgrade
for next year!

NAF CPU usage

Recommended limit: < 75%, peaks up to 90%

> NAF well used by German institutes

- ≈ 80% universities
- ≈ 20% by DESY scientists



Future of the Alliance

> DESY 5-years evaluation result

- Alliance highly appreciated by reviewers
- Specific recommendation
“... prioritised plans for continuing the Alliance should be described in a joint report by DESY and the university groups and submitted to the Helmholtz President by the end of 2011.”

> Very successful mid-term evaluation

> Status: sketch submitted

> Annual Workshop of Alliance early December

> Start preparing full proposal



Antragsskizze für ein Portfoliothema

PHYSIK AN DER TERASKALA

der Helmholtz-Zentren

Deutsches Elektronen Synchrotron (DESY) und
Karlsruher Institut für Technologie (KIT)

mit den vorgesehenen Partnern

Rheinisch-Westfälische Technische Hochschule Aachen	Humboldt-Universität zu Berlin
Rheinische Friedrich-Wilhelms-Universität Bonn	Technische Universität Dortmund
Technische Universität Dresden	Albert-Ludwigs-Universität Freiburg
Justus-Liebig-Universität Gießen	Georg-August-Universität Göttingen
Universität Hamburg	Ruprecht-Karls-Universität Heidelberg
Johannes Gutenberg-Universität Mainz	Ludwig-Maximilians-Universität München
Universität Regensburg	Universität Siegen
Julius-Maximilians-Universität Würzburg	Bergische Universität Wuppertal

und dem Max-Planck-Institut für Physik München.

Start 1. Juli 2012

Koordinierender Sprecher: Prof. Dr. Joachim Mnich (DESY)



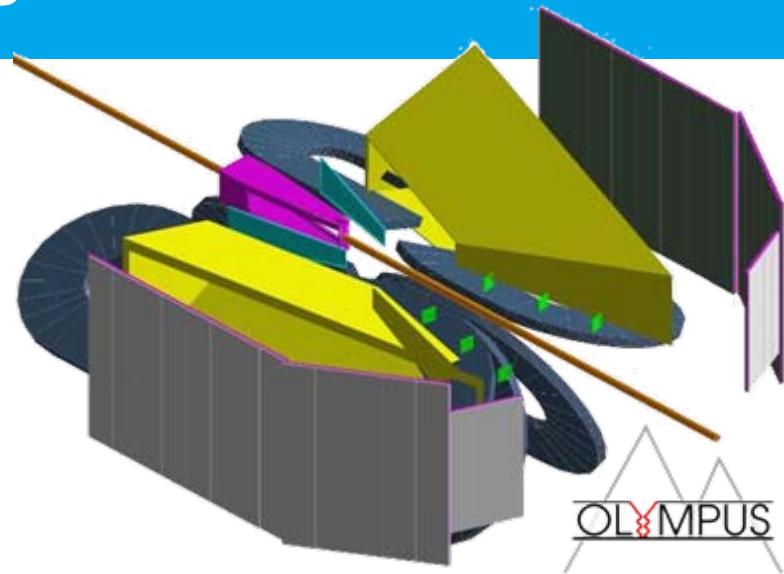


OLYMPUS Experiment at DORIS

- > Measurement of elastic cross section ratio e^+p vs e^-p
- > Use BLAST detector (MIT)

Schedule:

- > 2010 set-up experiment at DESY
- > 2011 commissioning
- > 2012 data taking (3 months)



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

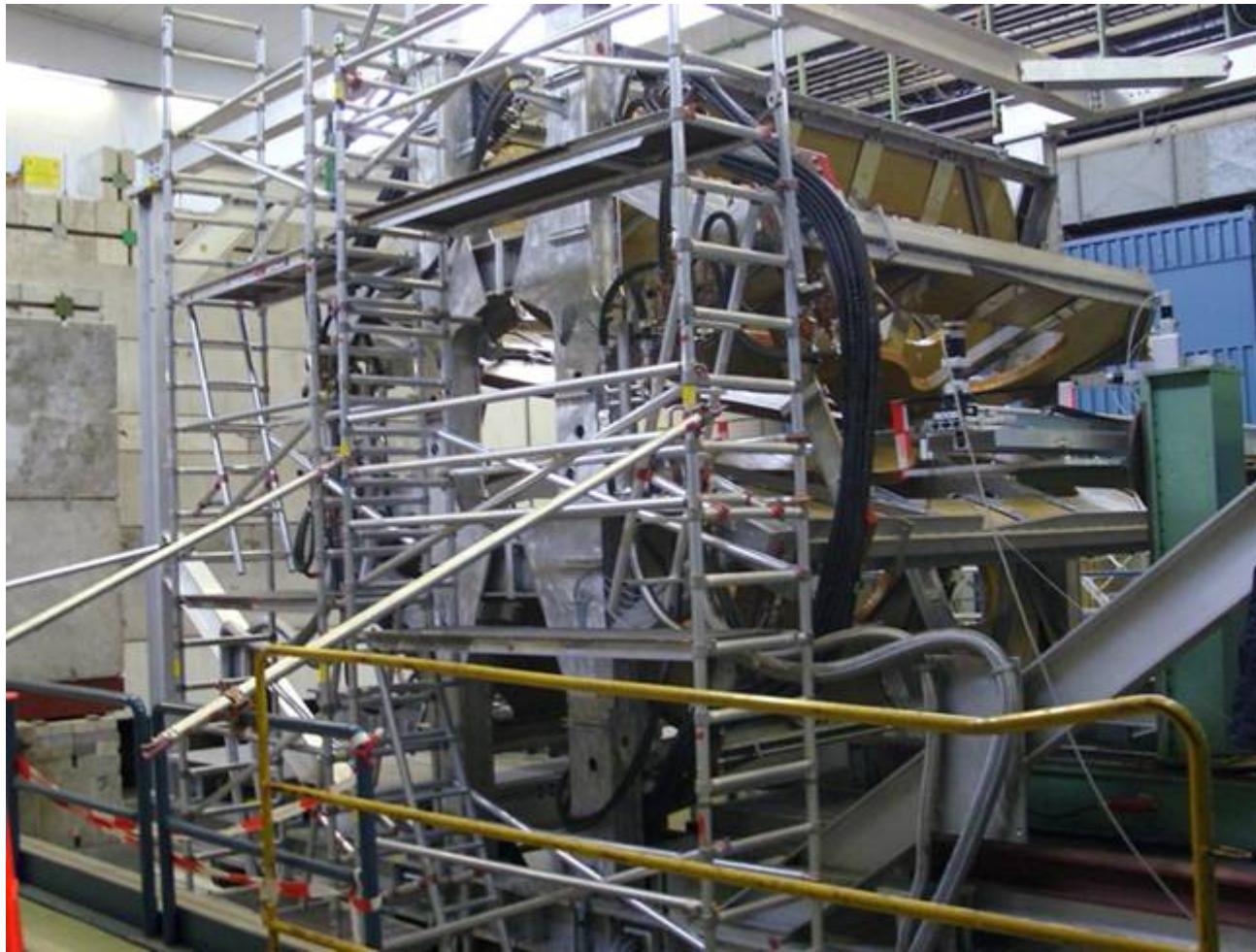
University of Kentucky, USA

Universität Mainz, Germany

University of New Hampshire, USA

Yerevan Physics Institute, Armenia

- > **Detector assembled in parking position**
 - Platform, rails, frames mounted
 - Toroidal coils installed and wired
 - Magnet tests and commissioning started
- > **Installation of vacuum system in DORIS January 2011**
- > **August 2011 move detector into beam line**



DESY Long-term Strategy in Particle Physics

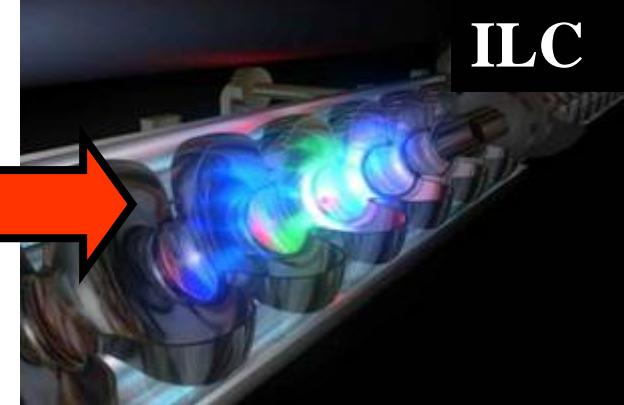
HERA



LHC



ILC



- > Accelerators
- > Detectors
- > Physics

- + support through strong theory group
- + computing infrastructure
- + testbeam & other infrastructures

- > In addition: Explore potential use of DESY infrastructure for particle physics
 - HERA: Z-factory, ep/eA, ...
 - High intensity electron beams (FLASH, XFEL)