

DESY.

Teilchenphysik.

- **News from DESY**
- **Helmholtz-Alliance „Physics at the Terascale“**

Joachim Mnich

KET Jahresversammlung
Bad Honnef, 17. November 2012



Beschleuniger | Forschung mit Photonen | Teilchenphysik

Deutsches Elektronen-Synchrotron
Ein Forschungszentrum der Helmholtz-Gemeinschaft



> Herta-Sponer-Preis 2013

Kerstin Tackmann (DESY)

- Helmholtz
Nachwuchsgruppe
- $H \rightarrow \gamma\gamma$ mit ATLAS



„Für ihre herausragenden Arbeiten auf dem Weg zum Nachweis des Higgs-Bosons am Large-Hadron-Collider (LHC) am CERN. Als führende Wissenschaftlerin hat sie entscheidend zum Nachweis eines neuen Teilchens beim Zerfall in zwei Photonen beigetragen. Dieses neue Teilchen ist ein vielversprechender Kandidat für das Higgs-Boson, mit dem das bestehende Standardmodell der Elementarteilchenphysik komplettiert würde.“

> **Max-Born-Preis 2013**

- **Deutsch-britische Auszeichnung**

Max Klein (Liverpool, ex-DESY)

- **Ehemaliger Sprecher H1-Kollaboration**



„Für fundamentale experimentelle Beiträge zur Aufklärung der Struktur des Protons mittels tief inelastischer Streuung.“

Status European XFEL

R. Brinkmann





- > Infrastructure set up at both manufacturers
- > Reference cavities successfully produced & tested
- > Full qualification of infrastructure in progress
- > Some delays, but expect ~50 cavities ready by end March 2013
- > Most critical component for start of series assembly of modules is RF coupler (but important progress recently)
- > Schedule very tight, but 1st beam autumn 2015 still possible

XFEL Operation

- > **German share of XFEL operation cost 60 M€/year as of 2015**
 - **Intense discussion between BMBF, Helmholtz and DESY**
 - **Will have significant impact on next funding period (PoF) starting 2015**



> Restructuring of research area for next PoF period (2015 ff)

Structure of Matter 4 programmes:

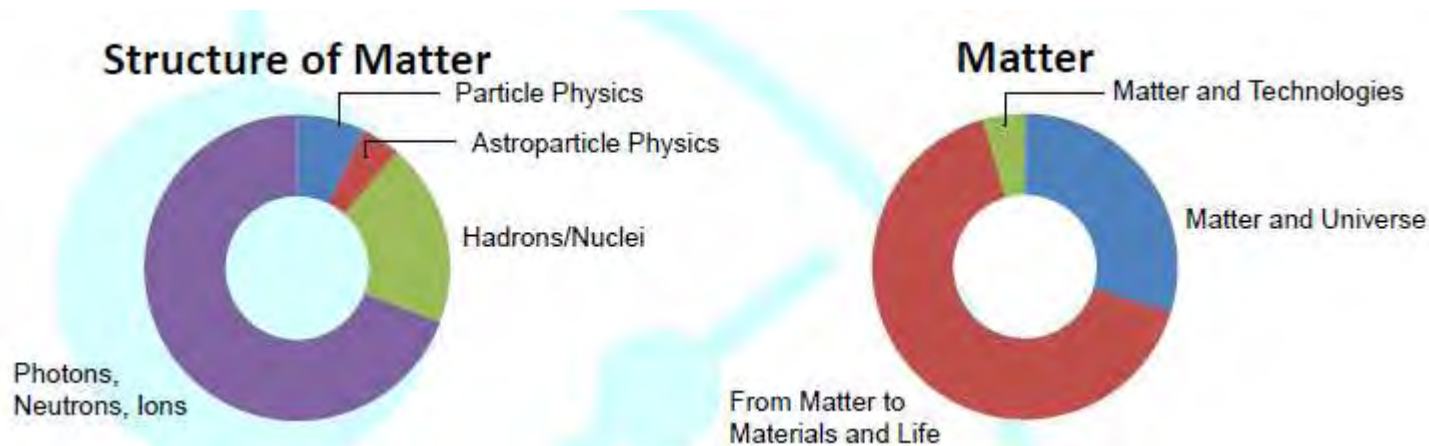
- Particle Physics
- Astroparticle Physics
- Hadron and Nuclei
- Photon, Nuclei, Ions



Matter 3 programmes:

- Matter and Universe
- From Matter to Materials and Life
- new** ▪ Matter and Technology
(Accelerator, Detector, Computing)

Portfolio topics accelerator, detector and computing approved



LHC Phase II Upgrades

> DESY submitted proposal to Helmholtz for strategic large investment funds

- Modern laboratory for large detectors
- Technical equipment
- Investment money for ATLAS & CMS upgrades
- Part of a larger proposal incl. more Helmholtz centres (GSI, KIT, FZJ, FZB, FZG)



DESY contribution



Request 20 M€ investments

> **Proposal not accepted**

- Very serious problem for us
- Requires major change/reduction in DESY plans



DESY Grid Centre

> **DESY operates Tier-2 centres for LHC (ATLAS, CMS & LHCb)**

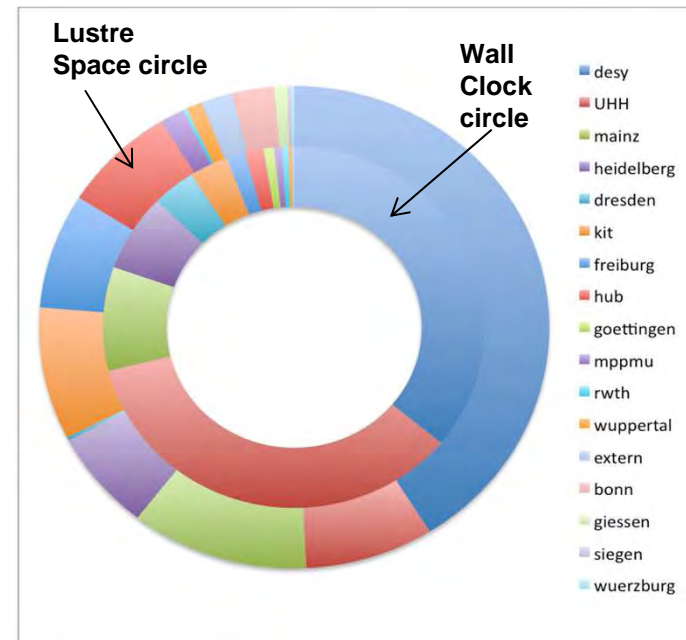
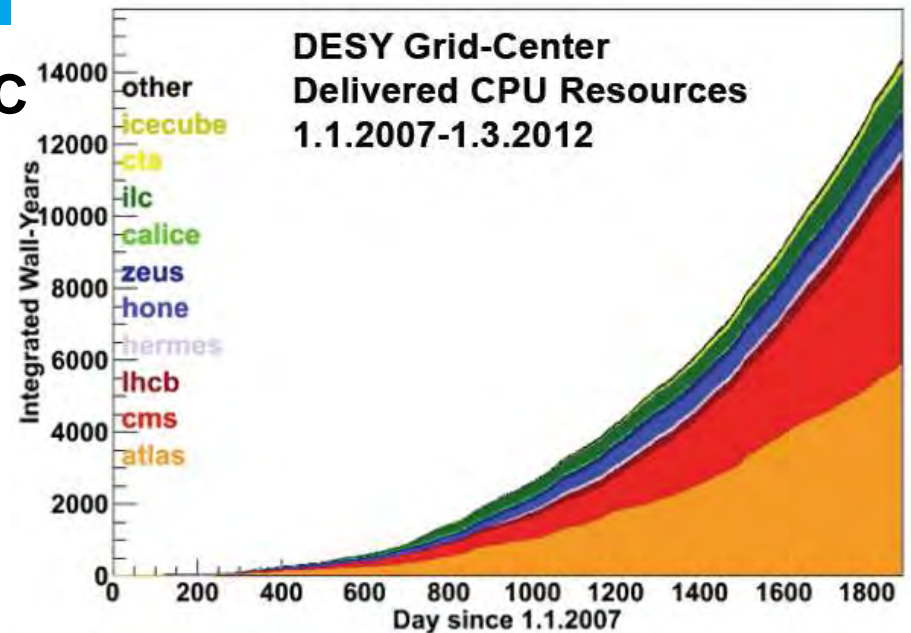
- covers about 1/2 of German pledges
- very high performance & reliability

> **Shared infrastructure used together with other projects astroparticle, HEP, ...**

> **National Analysis Facility (NAF)**

- created as part of Helmholtz Alliance
- Crucial element for LHC analysis in Germany
- used mainly by university groups

> **DESY will continue to support the NAF**



OLYMPUS Experiment at DORIS

> Measurement of elastic cross section ratio e^+p vs e^-p

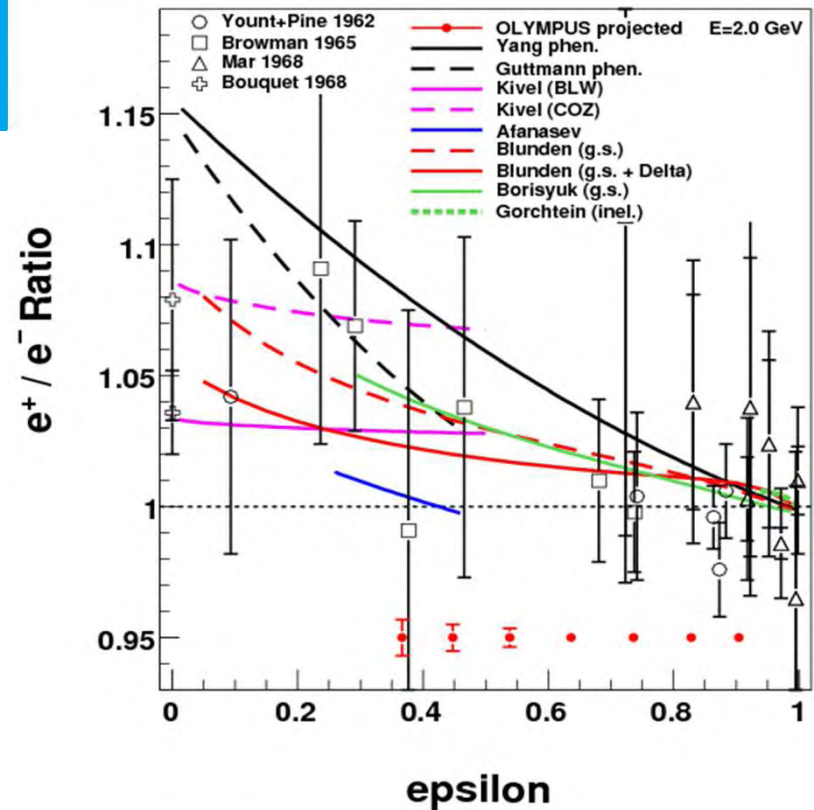
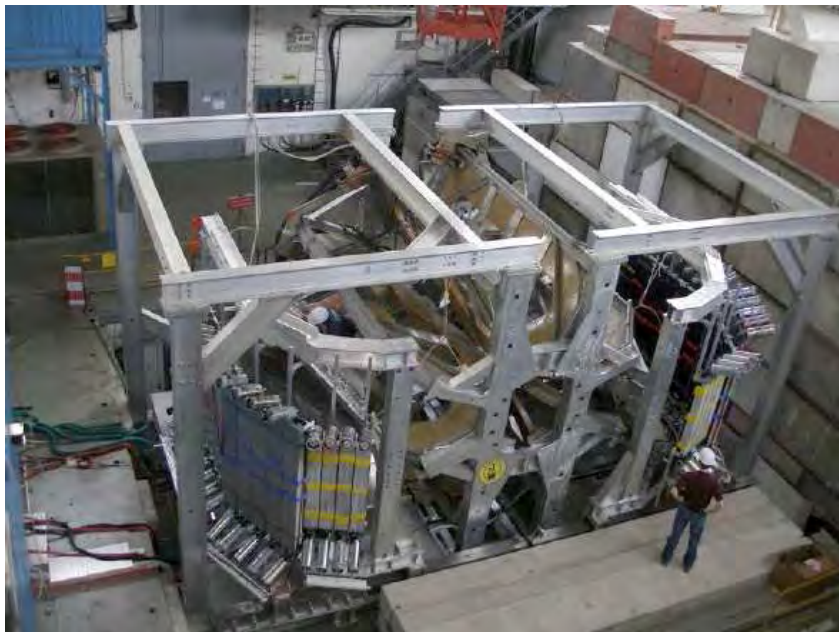
> Use BLAST detector (MIT)

Schedule:

> 2010 set-up experiment at DESY

> 2011 commissioning

> 2012 data taking (3 months)

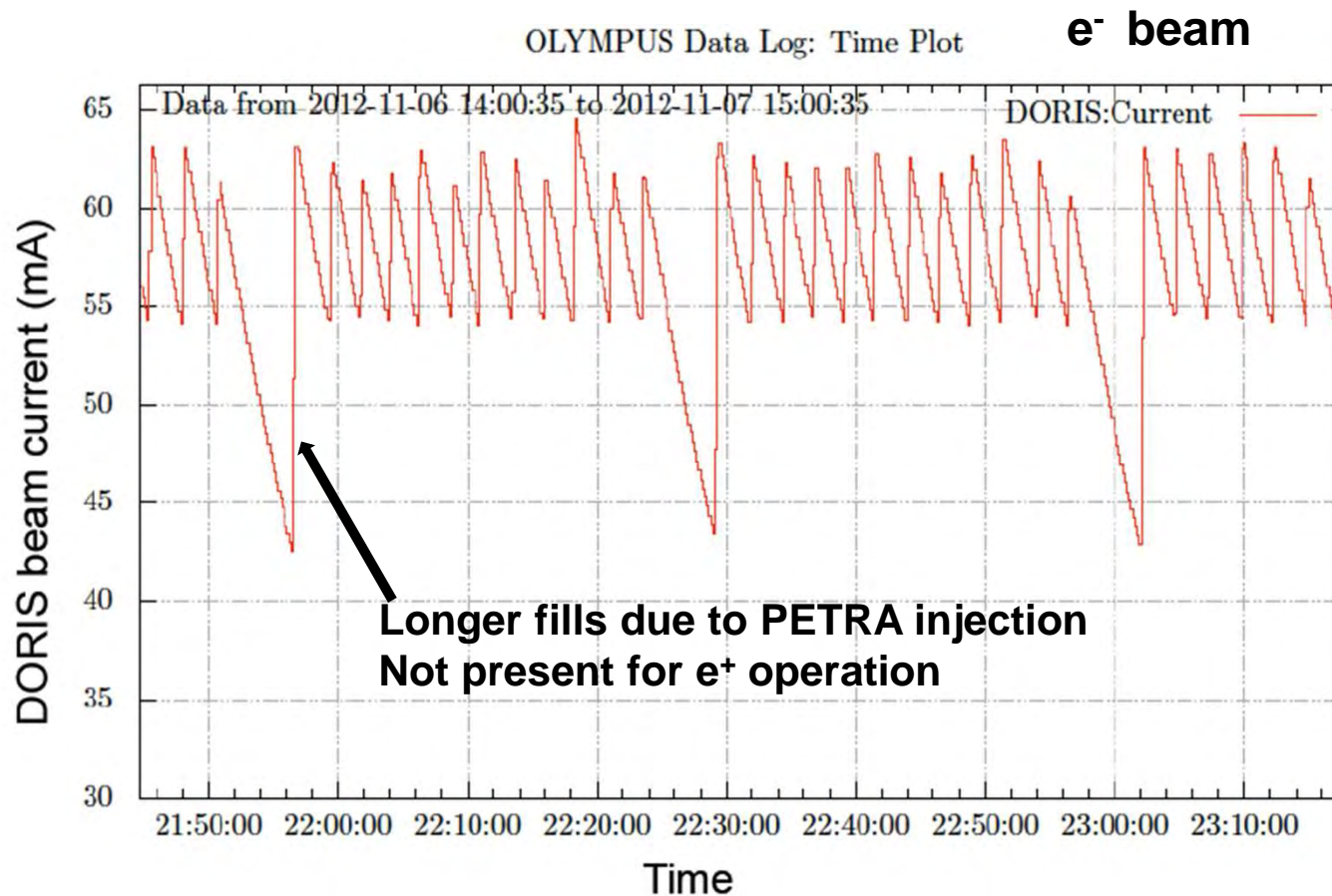


- Arizona State University, USA
- DESY, Hamburg, Germany
- Hampton University, USA
- INFN, Bari, Italy
- INFN, Ferrara, Italy
- INFN, Rome, Italy
- Massachusetts Institute of Technology, USA
- St. Petersburg Nuclear Physics Institute, Russia
- Universität Bonn, Germany
- University of Colorado, USA
- 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



OLYMPUS Data Taking

- > Final data taking period started end October
 - Peaceful coexistence between PETRA and OLYMPUS

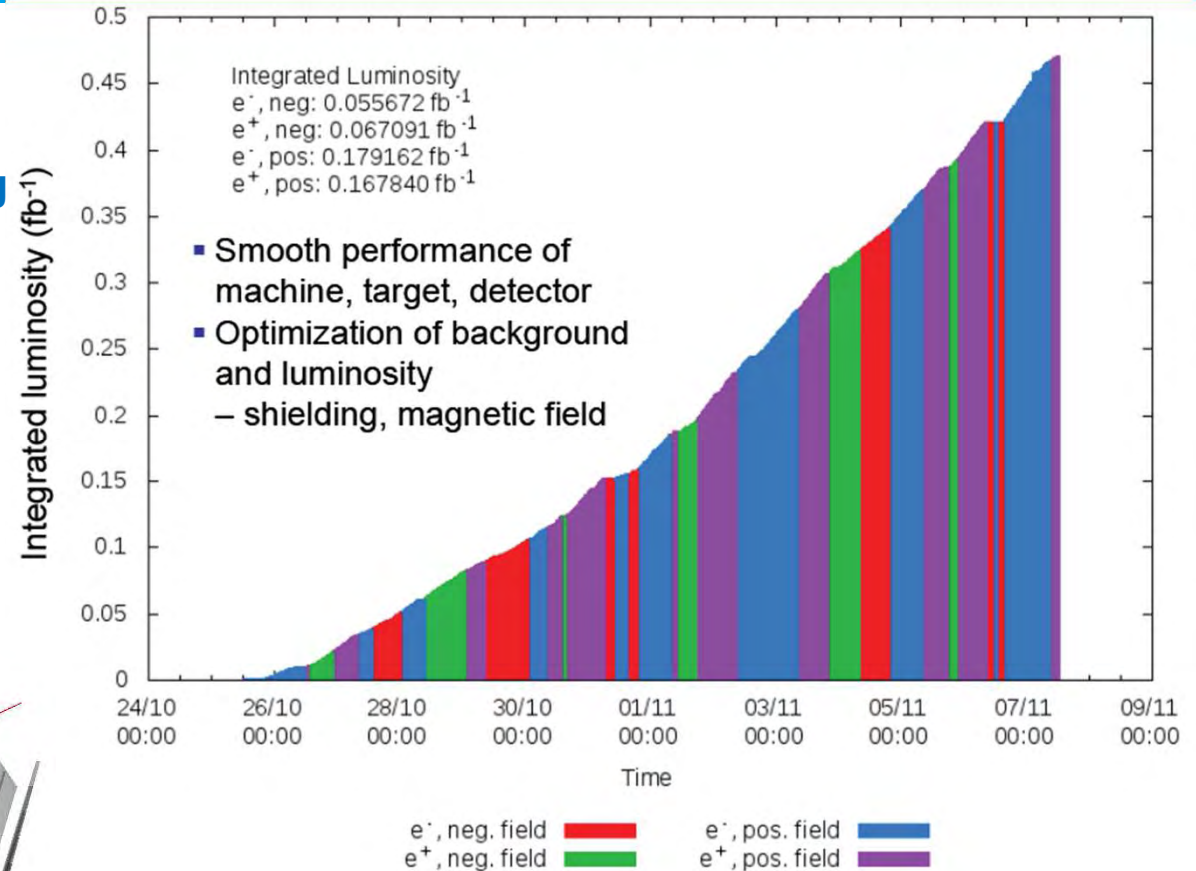
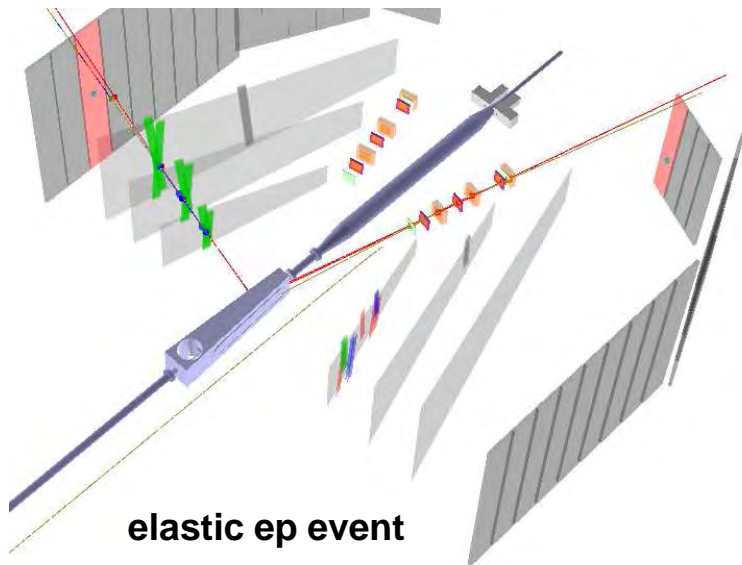


OLYMPUS Data Taking

> Remaining problem:

- high background depending on Toroid polarity
- limiting luminosity

> Target still in reach



> **DORIS will be shutdown Jan. 2nd 2013**

> **Event to celebrate all DORIS achievements planned for spring 2013**



Helmholtz Alliance “Physics at the Terascale”

- > Helmholtz IVF funding for the current Alliance ends December 2012
 - > Confirmed funding beyond 2012:
 - Approx. 1 Mio/year from DESY
 - Approx. 1 Mio/year from Universities
- Money is tied to specific positions**
- > Extra support from Helmholtz: 500k/year for 2013/2014
 - Support for (limited) continuation of structures
 - Support for workshop and schools program (but need significant engagement by DESY to maintain the current level)
 - Support for a small number of projects with clear and central contribution to the alliance goals
 - > **With the current funding beyond 2012 only a limited Alliance program will be possible!**
 - Schools & workshops
 - Hopefully keeping the structure in Germany
 - No support for common projects



> Aktivitäten 2012

- **16 Schulen und Workshops mit insgesamt über 1000 Teilnehmern**
Einführungskurse für Bachelor- und Masterstudenten bis zu
Expertenarbeitsgruppen
- **Viele Experiment-Theorie übergreifende Arbeitsgruppen aktiv**
Weitere Treffen während des Allianz Workshops am DESY
- **Project-Boards im Detektor- als auch GRID Bereich Project-Board**
sind wichtige Gremien für die Koordination in D dar

> Annual Workshop der Allianz

- **3.-5. Dezember 2012 am DESY, Hamburg**
- **Abschluss der ersten fünf Jahre der Allianz**
Viele Projekte stellen Ihre Ergebnisse vor (Postersession)



Allianz 2013/14

> Schulen und Workshops, Gäste und Reisemittel

- Ca. 130k€/Jahr + 75k€/Jahr (DESY) stehen zur Verfügung

> Projektmittel

▪ Neue Projekte

- Ausschreibung im August 2012
- Begutachtung und Ranking durch das International Advisory Board (Chair: Dieter Schlatter)
- Auswahl der drei Projekte mit der höchsten Wertung Ende September 2012
- 770k€ werden 2013/14 in drei Projekte investiert

▪ Ausgewählte Projekte

- Enabling Technologies for Silicon Microstrip Tracking Detectors at the HL-LHC (AC, B, DESY, FR, HH, KA), Kontakt: Lutz Feld
- Inclusive and Semi-Inclusive Constraints on the Parton Distributions at the LHC and the Study of Hard Processes (DESY, KIT, MZ, FR, W, HH), Kontakt: Johannes Blümlein
- Performance optimization for the present and next generation HEP data analysis on the Grid (DESY, KIT, AC, GÖ, M, W), Kontakt: Matthias Kasemann



Geplante Schulen, Workshops etc.*

Schulen:

- > **“Fast Simulation” Schule / Workshop (15.17.1.2013)**
- > **“Computer Algebra and Particle Physics” 11.-15.3.13**
- > **“Introduction to the Terascale” 25.2.-1.3.13**
- > **“Basic statistics” 18.-22.3.13**
- > **MC-Schule evtl. mit MCNet, Spätsommer**
- > **“Advanced Programming Concepts”, Oktober**
- > **Weiterhin geplant: “Advanced statistics”, “C++ 11”, evtl. “PDF and SM Candles”.**

Workshops / Konferenzen:

- **“Monte Carlo methods in natural science, engineering and economics”, 19-21.2.13**
- **Detector Workshop, 26.2.-1.3.13**
- **“Parton Shower + resummation” (mit Manchester, Durham, Spätsommer)**
- **Top-Workshop geplant**
- **Unterstützung für**
 - **MC4BSM (18.-20.4.13)**
 - **Top 2013 (15.-20.9.13)**
 - **QCD 2013 (3.-7.9.13)**
- **Theoretiker des Monats (zugesagt):**
 - **N. Glover (1/13), M. Krämer (2/13), R. Field (3/13), M. Cacciari (4/13),**

***Finanziell / organisatorisch unterstützt durch Analysezentrum.**

