

THE ANALYSIS CENTRE

IN THE HELMHOLTZ ALLIANCE “PHYSICS AT THE TERASCALE”

Thomas Schörner-Sadenius (DESY)

CMS DESY+UHH Meeting
22 October 2008

THE HELMHOLTZ ALLIANCE

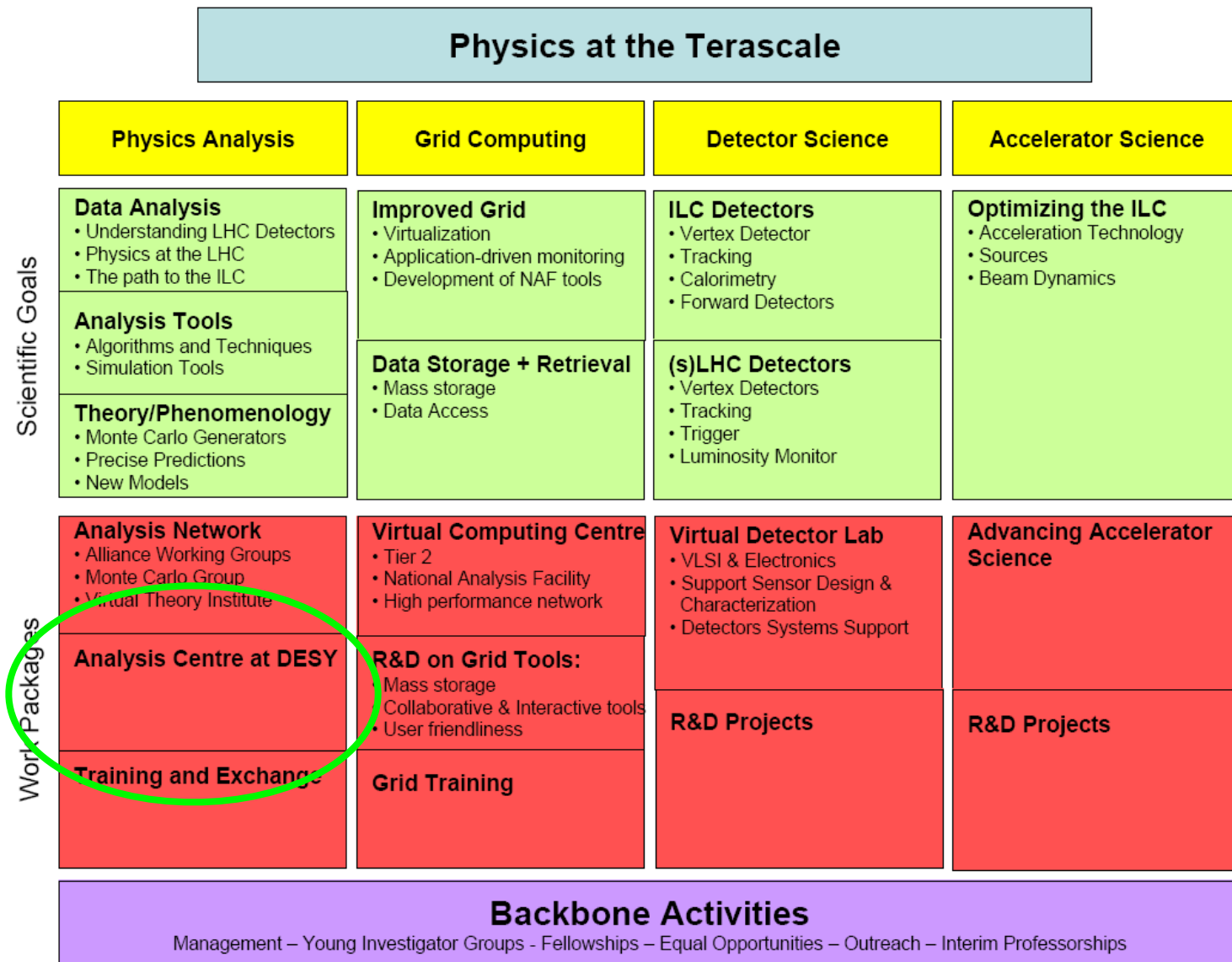
Quotation from the Alliance web page (<http://www.terascale.de>):

With the start-up of CERN's Large Hadron Collider (LHC) in 2007 and preparations for the International Linear Collider (ILC) in full swing, we expect revolutionary results explaining the origin of matter, unravelling the nature of dark matter and providing glimpses of extra spatial dimensions or grand unification of forces. Any of these insights would dramatically change our view of the world.

In order to **optimally place German particle physics in an increasingly global environment**, it is now the right moment to create new and improved structures for particle physics in Germany.

The Strategic Helmholtz Alliance 'Physics at the Terascale' is a structured research network comprising 17 universities, 2 Helmholtz institutes and 1 Max Planck Institute. The **Alliance acts as a tool for a more effective collaboration**, in particular between experimentalists and theorists.

THE HELMHOLTZ ALLIANCE

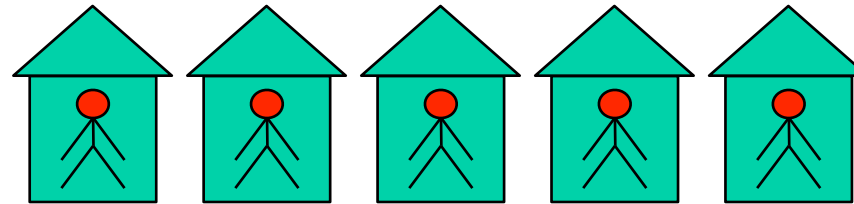


ANALYSIS CENTRE: TASKS

“... optimally place German particle physics
in an increasingly global environment ...”

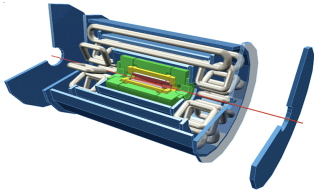
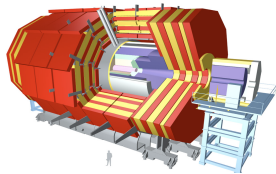
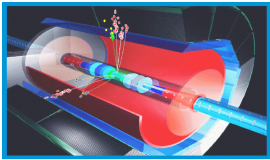
“... a tool for more effective collaboration ...”

ANALYSIS CENTRE: TASKS



Institutes
Fellows
YIGs

Experiments



“... optimally place German particle physics
in an increasingly global environment ...”

“... a tool for more effective collaboration ...”

Virtual
Theory
Institute

National
Analysis
Facility

WG1

WG3

WG2

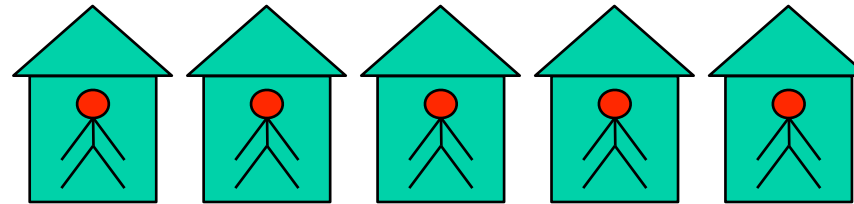


Workshop

Seminar

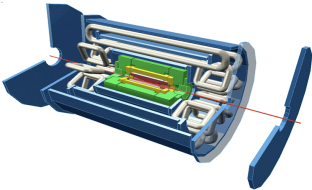
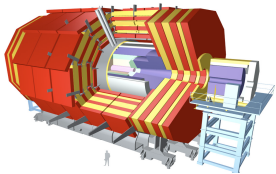
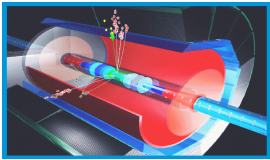
Meeting

ANALYSIS CENTRE: TASKS



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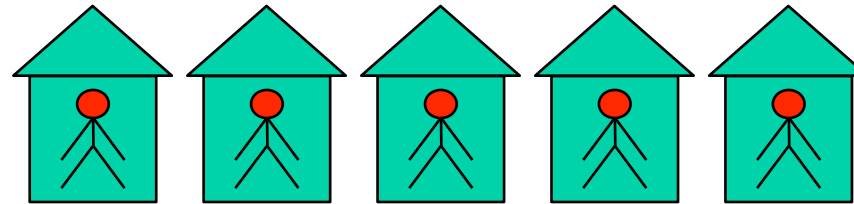


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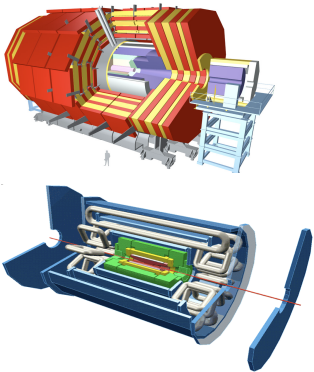
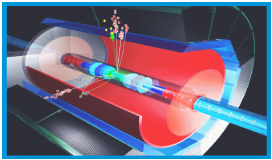
Meeting

ANALYSIS CENTRE: TASKS



Institutes
Fellows
YIGs

Experiments



1. Member support (MC, statistics, PDFs, analysis etc.)
2. “Education”: Schools, workshops, ...
3. Networking; definition and exploitation of synergies, ...
4. Contributions to the LHC programme

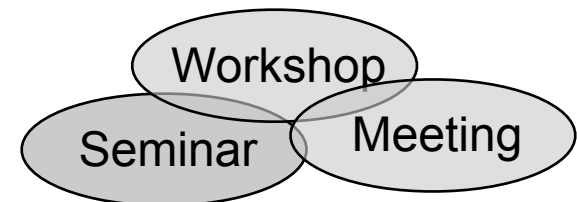
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WG2



THE ANALYSIS CENTRE

... is the centre of the whole Alliance (at DESY).

- It is the centre of all participating institutes and exists for their support ...
- but it depends on the input + feedback from the people working in the institutes - it depends on you!

Make use of the Analysis Centre by letting us know what you want, need, require, would like to hear, ...

- Which education and training?
- Which seminars, topics, speakers?
- Which tools and services?
- Which kind of user support?

- Where do you have specific expertise?
- Where could you help the community by sharing, maybe within the groups?
- What can others learn from you?



Don't (only) ask what your Alliance ...

Vision: Analysis Centre - the place to go! The centre ...
... offers help and support for beginners and advanced physicists.
... supports physicists finalising their analysis.
... acts as meeting point for people working on a common subject..

ANALYSIS CENTRE SO FAR

Formation of three groups:

- Monte Carlo generators (H. Jung, J. Katzy, S. Levonian):
 - Maintenance and support, validation and tuning, new developments in kT factorisation, for LO+NLO parton showers, for the CASCADE generator, GENSER mirror, ...
 - active group with regular meetings; since 1.9. Z. Nagy (NLOJET) on tenured position as support; involvement of groups in Karlsruhe and Wuppertal (future).
- Statistics tools (O. Behnke, C. Kleinwort, S. Schmitt):
 - Signal/background separation (TMVA etc.), significance determination, limits, data corrections, systematic uncertainties, ...
 - Development of tools, close contact to CERN statistics committee etc.
 - Open analysis centre position to be announced soon.
- PDFs (J. Bluemlein, S. Glazov, S.-O. Moch):
 - general support for PDF issues; theoretical contributions (higher orders for hard scattering processes, PDF theory,)
 - My personal dream: global PDF fitting activity with strong contributions from analysis centre.

Group life so far:

- organisation of introductory schools with very high interest from institutes.
- rich group life discussing work progress (MC group)
- efforts to attract more contributions from the institutes.
- Work week program starting right now.

Physics at the Terascale - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

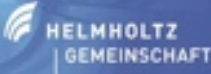
http://www.terascale.de/

Getting Started symphonie



PHYSICS AT THE TERASCALE

Strategic Helmholtz Alliance



Home General Information Research Topics Workshops Schools Career Calendar News Internal

Current News

2008/04/16: Articles in the Press

2008/10/14: 2nd Annual Workshop

2008/10/13: University of Regensburg is new Alliance Adjunct Partner

2008/09/15: Young Investigator Group in Dresden

Physics at the Terascale

Research in particle physics is motivated by the goal of attaining a fundamental description of the laws of physics, such as explaining the origin of mass and understanding the dark matter in the universe. Although fundamentally driven by the quest for knowledge, the ensuing research is performed at the edge of what is feasible technologically and hence drives the development of technology in many areas.

With the start-up of CERN's [Large Hadron Collider \(LHC\)](#) in 2007 and preparations for the [International Linear Collider \(ILC\)](#) in full swing, we expect revolutionary results explaining the origin of matter, unravelling the nature of dark matter and providing glimpses of extra spatial dimensions or grand unification of forces. Any of these insights would dramatically change our view of the world.

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The Strategic [Helmholtz Alliance 'Physics at the Terascale'](#) is a structured research network comprising 17 universities, 2 Helmholtz Institutes and 1 Max Planck Institute. The Alliance acts as a tool for a more effective collaboration, in particular between experimentalists and theorists.

The Alliance covers four Research Topics, addressing the fundamental questions of particle physics, distributed computing, novel detector development and accelerator science.

An important aspect of the Alliance is the creation of common infrastructures. All partners of the Alliance contribute to and use these infrastructures for specific research projects. One example of such infrastructure is the [National Analysis Facility \(NAF\)](#). The Virtual Theory Institute (VTI) holds regular [seminars](#) starting in June 2008. These are broadcast via [ExQ](#) and all Alliance members can participate. The [Analysis Centre](#) provides training, support and own contributions for all analysis-related issues, currently focusing on Monte Carlo generators, parton distribution functions, and statistics tools.

The Alliance is part of a much broader truly international effort to explore the physics at the Terascale. It is the goal of the Alliance to strengthen the position of the German groups working in the field through this coherent ansatz.

Linkbox

- [Analysis Centre](#)
- [National Analysis Facility](#)
- [Helmholtz Association](#)
- [Large Hadron Collider](#)
- [International Linear Collider](#)
- [Subscribe to the Alliance general mailing list](#)

One click to the Terascale

[Alliance this month](#)

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- web pages existing
- wiki starting to build up
- aim: FAQ, services, discussion forum, contacts, literature lists etc.
- project: QCDPedia



PHYSICS AT THE TERASCALE

Strategic Helmholtz Alliance



Home General Information Research Topics Workshops Schools Career Calendar News Internal

Analysis Centre

- Monte Carlo Group
- Statistics Tools Group
- PDF Group
- Making use of the centre
- People in the centre
- Old news

Physics at the Terascale » Research Topics » RT1: Physics Analysis » Analysis Centre »

Analysis Centre

News

October 10, 2008: The [Analysis Centre web pages](#) are starting to build up!

October 9, 2008: All talks (and exercises with solutions) of the [statistics school](#) available via [indico](#)

Forthcoming events

November 12-14, 2008: [PDF school](#) at DESY/Zentrum

Mission of the Analysis Centre

The Analysis Centre of the Helmholtz Alliance supports physicists from German groups on general data analysis issues. This is done by

- providing training and education on analysis-related topics through schools, workshops and seminars;
- providing support and assistance for individual user problems;
- strengthening the collaboration between different institutes and experiments and between experiment and theory;
- carrying out own research and creating significant contributions to the data analysis project.

The Analysis Centre currently comprises three main activities, namely Monte Carlo generators, parton distribution functions, and statistics tools.

The [Monte Carlo Generator group](#) works towards providing training, support and own contributions in the field of Monte Carlo generators. For this purpose, it is building on the experience already present at DESY and is forming a network of Monte Carlo-related activities in German and other institutes. Besides organising schools and workshops and being a place for discussion, the group is working on the tuning and validation of MC models with the first LHC data, on the development of [HcTool](#) and [Rivet](#), and on the (further) development of parton showers models and certain MC generators (CASCADE).

The activities of the [Statistics Tools group](#) comprise the development of statistics tools necessary for data analysis, the implementation of tools into software frameworks like [ROOT](#), and the support of the community in statistics-related questions. The group is organising a series of workshops around the issues of limit determination, fitting, signal-background separation, and data corrections.

The [PDF group](#) activities build on in-house expertise in the analysis of DIS structure function data from HERA, and on precise theoretical predictions for hard scattering processes. It will assist in precision determinations of the parton luminosity at the LHC.

CONTACTS

Analysis Centre:

- anacentre@desy.de: general contact e-mail address
- thomas.schoerner@desy.de: ... a good address in any case ;-) ...

MC:

- hannes.jung@desy.de, judith.katzy@desy.de, serguei.levonian@desy.de
- soon something like anacentre-mc@desy.de (please see web pages for news)

Statistics Tools:

- olaf.behnke@desy.de, stefan.schmitt@desy.de, claus.kleinwort@desy.de
- soon something like anacentre-statistics@desy.de

PDF:

- sven-olaf.moch@desy.de, alexandre.glazov@desy.de, johannes.bluemlein@desy.de
- soon something like anacentre-pdf@desy.de

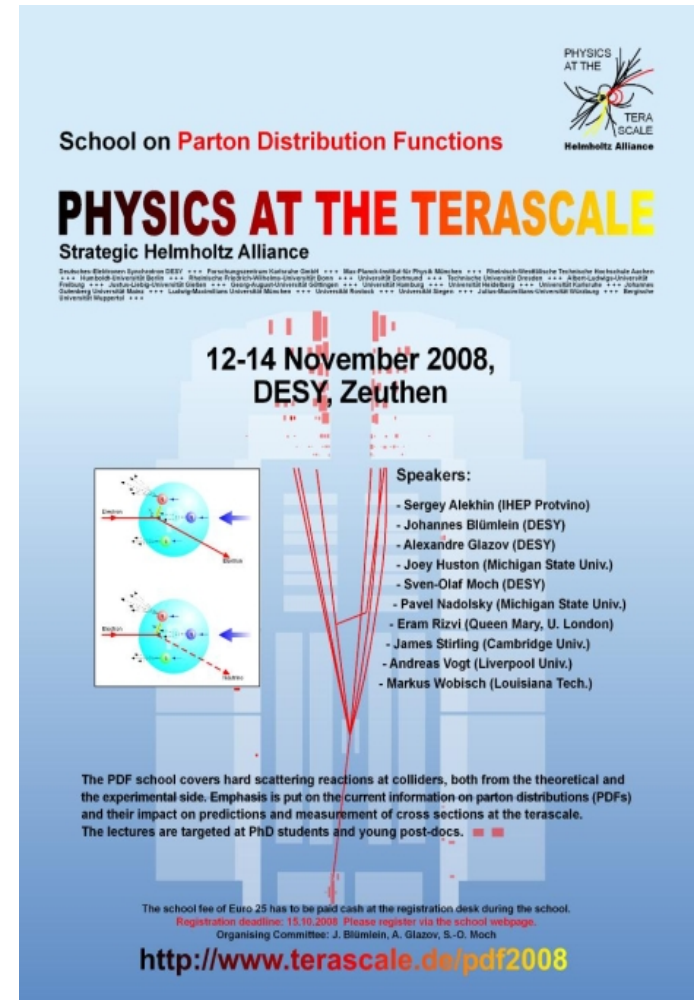
... and all of the persons above directly, of course ...

- MC School, 100 participants
- Statistics Tools School, 120 participants

- PDF School, Zeuthen, 12-14 November 2008
- Alliance Meeting, Aachen, 26-28 November 2008

- Grid Tools Workshop, February 2009
- Fitting Workshop, March 2009
- MC School 2009, April 2009
- Computer Algebra School
- ...

- CTEQ+MCNET+Alliance School 2010



ANALYSIS CENTRE: WORK WEEKS

New instruments to increase attractiveness of groups:

Analysis Centre Working Weeks

- Bring together small number of experts to work on well-defined problem for limited period of time, ~1 week.
- Provide creative atmosphere, a bunch of experts, work space, opportunity for discussion and exchange ...
- mid/long-term effect: Accumulation of experience in the centre.

Planned working weeks:

- MC group:
 - Problems with the colour-dipole model (Marchesini)
 - Minimum bias, underlying event and MPI (Gieseke, Lund)
 - PDF4MC (Huston)
- PDF group:
 - PDFs and luminosity determination (Thorne, Nadolsky)
 - Heavy flavour in PDF fits (Vogt, Alekhin)
 - role of strangeness in PDFs (Thorne, N.N. from HERMES)

Open for your suggestions and wishes - there is money, opportunity, space, contacts, ... to bring people together and profit.

QUESTIONS

- Which services? Which form of user support? (FAQ, link lists, “helpdesk” for MC/PDF/statistics, the place to go and ask questions, necessity, ...)
- Which training? School? Workshop? Speaker? Topic?
- Which (additional) working groups?
- Your connection to the centre? Overlap activities with the centre? With other groups? Your specific expertise? Sharing?
- Your experience with the centre (if any)? Bare knowledge? Schools? Working groups?

- Usage of the NAF? Grid/batch/interactive tool with lots of storage and privileged access ...

- Software tools? Visualisation? Interactive analysis?
 - > discussion session in near future