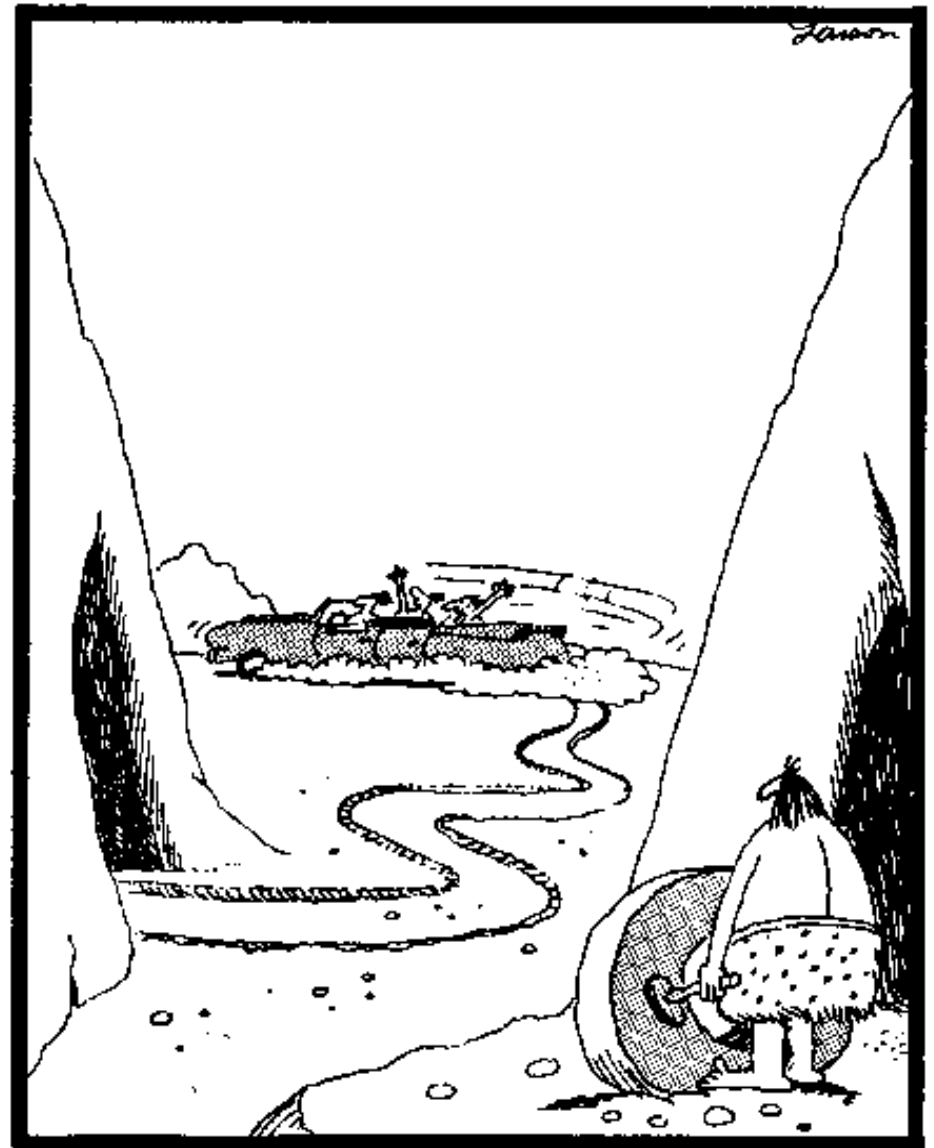# Welcome!

## Terascale Statistics Tools Meeting
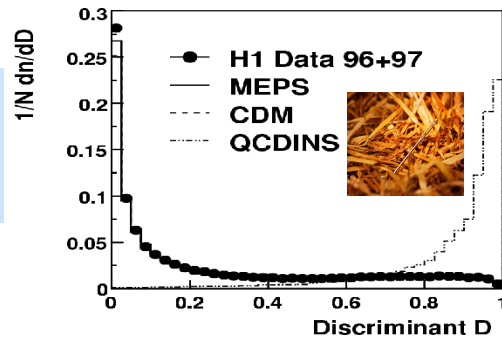
20 Nov, 2008, DESY

<u>Olaf Behnke</u>, Claus Kleinwort,
Stefan Schmitt, Thomas Schoerner (all DESY)
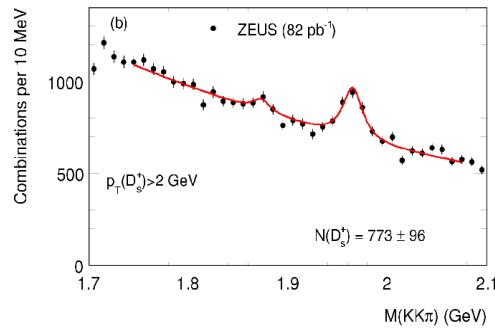
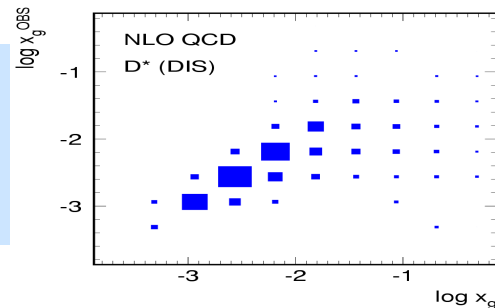# Terascale Statistics Tools group: Main areas and goals

**1. Optimal S/B separation**



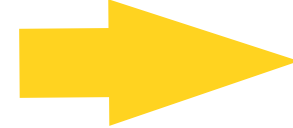**2. Signal searches, fits & limits**



**3. Data Corrections (unfolding etc.)**



**4. Systematic errors & other practical tasks**



Phd thesis path

**Reminder**

**General Goal: Provide Tools, Support, Education for Physics analyses in ATLAS and CMS**

# Terascale Statistical Tools project

| | *2008* | *2009* |
|---|---|---|
| **Education** | ✔ **Miniworkshop 19.6.**<br>https://indico.desy.de/conferenceTimeTable.py?confId=**1097**<br><br>✔ **School on statistics Tools 29.9.-2.10.**<br>https://indico.desy.de/conferenceTimeTable.py?confId=**1149** | |
| **Support** | ✔ Good ideas... but to be started... | |
| **Tools development** | ✔ **Several project ideas collected** (continue today)<br>✔ *New: Postdoc position available* | |

# Statistics Tools School 29th sep – 02th oct 2008

✔ Impressive number of participants: 122 students and postdocs from all over germany

✔ Nice lectures by super experts, e.g. **Glen Cowan** and **Luc Demortier** on Bayesian and frequentist approaches and limits, **Volker Blobel** on fitting and unfolding, **Helge Voss** on multivariate analyses, **Rainer Wanke** on systematic errors...

✔ Paper and computer practical work

✔ In general program was very well received, weak points:

    ✔ Lectures were sometimes rather too abstract or theoretical and disconnected to the day-to-day statistical problems

    ✔ By far not enough time for the practical work, especially with the computer

plan for 2 days fitting workshop 30/31 march 2009
enjoying/working through practical exemplary fit examples/problems

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# Some ideas/examples for statistical tools projects (for more see also the later talk contributions and discussion today)

✔ **Concrete project ideas for further development of the TMVA Tool (contact person Andreas Hoecker, CERN)**

✔ **Implementation of Volker Blobels LVMINI Fit program/algorithms in Root**

✔ **Bob Cousins: expressed wish that we do validation/tests of limit tools**

✔ **Many ongoing tools developments by Alliance members, e.g Bayesian analysis Tool (see presentation by Kevin Kroeninger) – Open question: what kind of frame/support/visibility can we (the analysis centre) give them?**

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# Alliance statistics tools Postdoc Job Posting Nov 2008

The Strategic Helmholtz Alliance "Physics at the Terascale" (http://www.terascale.de) is a research network supported by the Helmholtz Association and comprises the research centres DESY and FZ Karlsruhe, 17 German universities and the Max-Planck-Institut for Physics. Within the framework of the worldwide investigation of the fundamental properties of matter using accelerators at the highest energies, the Alliance will sustainably concentrate and advance the expertise and strengths of the participating institutes.

We are seeking a scientist for the Analysis Centre of the Helmholtz Alliance "Physics at the Terascale" at DESY, Hamburg location. The successful candidate is expected to the join the Statistics Tools group of the centre.

The Analysis Centre supports physicists at German universities and institutes working on analyses at ATLAS, CMS and ILC. The centre contains three main branches Monte Carlo Generators, Parton Distribution Functions, and Statistics Tools. A major goal of the Statistics Tools group is to provide support and education for all kinds of statistics-related tasks and questions in high-energy physics data analyses.

The successful candidate is supposed to strengthen the activities of the group by
- contributing to the development of statistics tools,
- implementing existing tools into software frameworks like ROOT,
- taking part in the organisation of meetings, workshops and schools and
- helping to provide user support and web documentation.
The candidate is also expected to carry out research within one of the Alliance projects for about 50% of his or her time.

The position requires
- a Ph.D. in physics,
- interest and experience in the development of statistics tools,
- programming, software maintenance and analysis experience (e.g. C++, Fortran, ROOT).

The position is initially limited until 30 June 2012, the nominal end of the Helmholtz Alliance funding period.

For further information please contact Ian Brock (Ian.Brock@desy.de) or Thomas Schörner-Sadenius (Thomas.Schoerner@desy.de).

Applications including a letter of application, CV, academic record as well as a list of publications and the names of three persons who can provide further information about the candidate should be addressed to:

Prof. Ian Brock (Scientific Manager of the Helmholtz Alliance)
DESY, Notkestraße 85, 22607 Hamburg, Germany (Ian.Brock@desy.de)

Salary and benefits are commensurate with those of public service organisations in Germany. Handicapped persons will be given preference to other equally qualified applicants. DESY is an equal opportunity, affirmative action employer and encourages applications from women. DESY has an English-speaking kindergarten on site.

Closing date for applications is 15 December 2008.

# Terascale Statistical Tools project

| | 2008 | 2009 |
|---|---|---|
| **Education** | ✔ **Miniworkshop 19.6.** <br> https://indico.desy.de/conferenceTimeTable.py?confId=**1097** <br><br> ✔ **School on statistics Tools 29.9.-2.10.** <br> https://indico.desy.de/conferenceTimeTable.py?confId=**1149** | ✔ **Fitworkshop (practical problems) 30/31 March** <br> ✔ **More regular seminars on selected topics** |
| **Support** | ✔ **Good ideas... but to be started...** | ✔ **Use common wiki DOKU platform in analysis centre:** <br> ✔ **Moderated discussion forum for all kind of statistics questions** |
| **Tools development** | ✔ **Several project ideas collected** (continue today) <br> ✔ ***New: Postdoc position available*** | ✔ **Develop/implement statistics tools, e.g. in ROOT** <br> ✔ **Provide platform/visibility for alliance statistics tools** |

# Backup

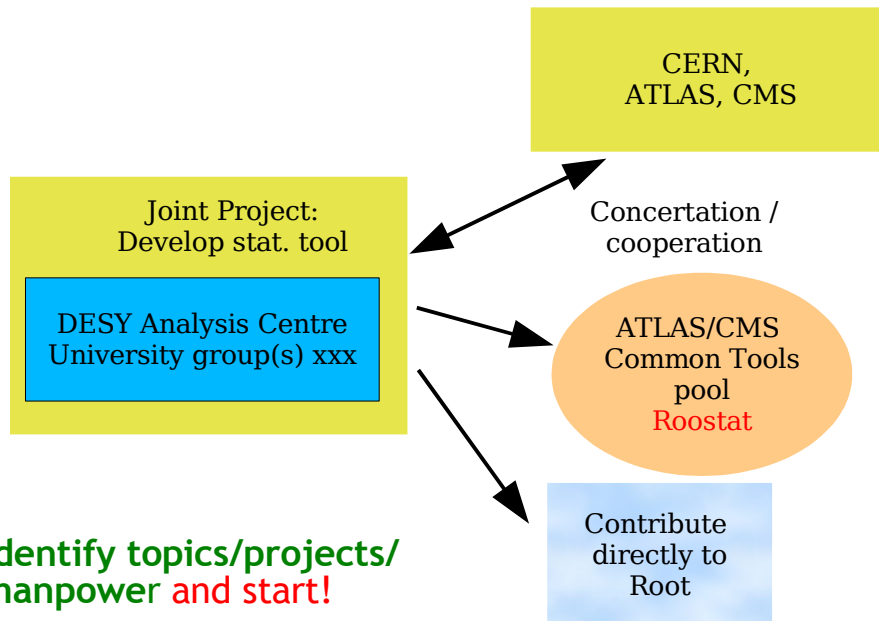# Terascale Statistical Tools project overview 2008

## Mission:

✔ Provide tools/support/education for
  1. Optimised S/B
  2. Signal searches, fits, limits
  3. Data corrections (Unfolding)
  4. Sys. Errors and other practical stat. problems/tasks in LHC physics analyses

## Who:

✔ DESY Analysis Centre: C.K, S.S., O.B, T.S.
  + further dedicated manpower
  cross connections to MC and PDF groups

✔ HEP groups @ DESY, universities and other institutes in the alliance

*Nov 08: New dedicated Postdoc position posted*

## 1. Tools (development, validation)

CERN, ATLAS, CMS

Joint Project: Develop stat. tool

DESY Analysis Centre University group(s) xxx

Concertation / cooperation

ATLAS/CMS Common Tools pool Roostat

Contribute directly to Root

✔ **Identify topics/projects/ manpower and start!**

## 2. Support / Help

✔ Install common platform(s) in analysis centre:
  ✔ Moderated discussion forum for (all kind of) questions
  ✔ Use mediawiki/twiki

## 3. Education

✔ **Miniworkshop 19.6.**
✔ **School on stat. Tools 29.9.-2.10.**
✔ **Regular seminars, e.g. on how to treat pdf uncertainties**

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