

Introductory School to Terascale Physics

Helmholtz Alliance
PHYSICS AT THE TERASCALE

Deutsches Elektronen-Synchrotron DESY ••• Forschungszentrum Karlsruhe ••• Max-Planck-Institut für Physik ••• Rheinisch-Westfälische Technische Hochschule Aachen ••• Universität Bonn ••• Rheinische Friedrich-Wilhelms-Universität Bonn ••• Technische Universität Darmstadt ••• Technische Universität Dresden ••• Albert-Ludwigs-Universität Freiburg ••• Julius-Liebig-Universität Gießen ••• Georg-August-Universität Göttingen ••• Universität Hamburg ••• Ruprecht-Karls-Universität Heidelberg ••• Universität Karlsruhe (TH) ••• Johannes-Gutenberg-Universität Mainz ••• Ludwig-Maximilians-Universität München ••• Universität Regensburg ••• Universität Rostock ••• Universität Siegen ••• Julius-Maximilians-Universität Würzburg ••• Eberhard-Karls-Universität Tübingen ••• Universität Wuppertal •••

PHYSICS AT THE TERASCALE
 Helmholtz Alliance

**Introductory School
 "Terascale Physics"**

**8-12 March 2010
 DESY, Hamburg Site**

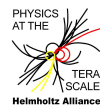
The "Introductory School on Terascale Physics" aims at providing the essential information and techniques on the subject that bachelor students may find very helpful for a productive thesis.

The programme consists of lectures and specially designed hands-on tutorials and computer exercises on physics, data analysis and technical issues. Examples are:

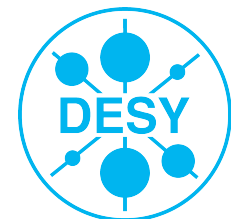
- Physics at the Terascale
- ROOT
- Standard Model electroweak processes at LHC
- Z and W physics at the LHC
- QCD at LHC
- Monte Carlo techniques and programmes
- Top physics and searches
- Statistics

Registration and admission to the school will be through a selection by the organisers. Please send an email to anacn@desy.de, mentioning the name and institute of your supervisor, together with a short sketch of your interest in high-energy physics and your experience with the field (if any). The school fee will be 50 Euros. Support for travel and accommodation can be granted on request. For more details also on the programme see <http://www.terascale.de/istp2010>

Thomas Schörner-Sadenius



Introductory School to Terascale Physics
 DESY Hamburg, 8-12 March 2010



WELCOME ...

- > ... to the first “Introductory School to Terascale Physics”!
- > We are extremely happy to welcome 50 young physicists here at DESY for 5 days of lectures, tutorials, social interaction etc.
 - Some flavour of high-energy physics working atmosphere.
 - Beginning of important networking among (future) colleagues.
 - Teaching of aspects vital for successful bachelor / diploma thesis.
- > We have been working for this event for quite some time ...
 - ... and encountered a lot of scepticism and
 - ... will have to improvise a lot and
 - ... don't really know ourselves yet what will be our picture at the end of this week.
- > Difficult to find the right level of difficulty ...
 - ... but we think that there is something in it for everybody.
- > Your feedback is essential for us ...
 - ... you will have plenty of opportunity to give!

PROGRAMME

	Monday 08 March 2010	Tuesday 09 March 2010	Wednesday 10 March 2010	Thursday 11 March 2010	Friday 12 March 2010
AM	09:00 Registration (until 12:30)	08:30 Electroweak physics I (until 12:30)	08:30 Ingredients for measurements, and electroweak physics (2) (until 12:30)	08:30 Top physics (until 12:30)	08:30 Student reports (until 11:00)
	12:30 Lunch (until 14:00)	08:30 Lecture: Standard Model electroweak process at LHC / ILC (1) - Arno Straessner (IKTP, TU Dresden)	08:30 Lecture: Measuring cross sections at LHC (1) - Ian Brock (University of Bonn)	08:30 Lecture: Top physics and necessary tools - Arnulf Quadt (II. Physikalisches Institut, Georg-August-Universität Göttingen)	11:00 Discussion, questions&answers, school closing (until 12:30)
		09:10 --- Short break ---	09:10 --- Short break ---	09:10 --- Short break ---	
		09:20 Lecture: Standard Model electroweak process at LHC / ILC (2) - Arno Straessner (IKTP, TU Dresden)	09:20 Lecture: Measuring cross sections at LHC (2) - Ian Brock (University of Bonn)	09:20 Lecture: Top physics and necessary tools (2) - Arnulf Quadt (II. Physikalisches Institut, Georg-August-Universität Göttingen)	
		10:00 --- Coffee break ---	09:55 --- Coffee break ---	09:55 --- Coffee break ---	12:30 --- Lunch ---
		10:20 Tutorial: Z->ll physics (1) - Arno Straessner (IKTP, TU Dresden) Eckhard von Toerne (University of Bonn)	10:20 Tutorial: W physics (1) - Arno Straessner (IKTP, TU Dresden) Eckhard von Toerne (University of Bonn)	10:20 Tutorial: Top physics - Wolfgang Wagner (Bergische Universität Wuppertal)	
		11:20 --- Short break ---	11:20 --- Short break ---	11:20 --- Short break ---	
		11:30 Tutorial: Z->ll physics (2) - Arno Straessner (IKTP, TU Dresden) Eckhard von Toerne (University of Bonn)	11:30 Tutorial: W physics (2) - Arno Straessner (IKTP, TU Dresden) Eckhard von Toerne (University of Bonn)	11:30 Tutorial: Top physics (2) - Wolfgang Wagner (Bergische Universität Wuppertal)	
		12:30 Lunch (until 14:00)	12:30 --- break ---	12:30 --- Lunch ---	
PM	14:00 (Important) Preliminaries (until 18:30)	14:00 QCD (until 18:30)	14:00 Monte Carlo (until 18:30)	14:00 Higgs, searches, and statistics (until 18:30)	
	14:00 Welcome and organisational issues - Thomas Schoerner-Sadenius (DESY)	14:00 Lecture: QCD at LHC (1) - Thomas Schoerner-Sadenius (DESY)	14:00 Lecture: Monte Carlo simulation and calculations for high-energy physics (1) - Zoltan Nagy (DESY)	14:00 Lecture: Higgs and other searches (1) - Ivor Fleck (Siegen)	
	14:20 Introductory lecture: Physics at the Terascale (1) - Daniel Wicke (U Mainz)	14:40 --- Short break ---	14:40 --- Short break ---	14:40 --- Short break ---	
	15:00 --- Short break ---	14:50 Lecture: QCD at LHC (2) - Thomas Schoerner-Sadenius (DESY)	14:50 Lecture: Monte Carlo simulation and calculations for high-energy physics (2) - Zoltan Nagy (DESY)	14:50 Lecture: Higgs and other searches (2) - Ivor Fleck (Siegen)	
	15:10 Introductory lecture: Physics at the Terascale (2) - Daniel Wicke (U Mainz)	15:25 --- Coffee break ---	15:25 --- Coffee break ---	15:25 --- Coffee break ---	
	15:50 --- Coffee break ---	15:45 Tutorial: Jets at LHC (1) - Frederik Ruehr (Heidelberg)	15:45 Tutorial: Monte Carlo (1) - Stefan Gieseke (Universitaet Karlsruhe)	15:45 Tutorial: Searches and statistics (1) - Ivor Fleck (Siegen)	
	16:10 Tutorial: ROOT (1) - Kevin Kroeninger (University of Goettingen)	17:05 --- Short break ---	17:05 --- Short break ---	17:05 --- Short break ---	
	17:10 --- Short break ---	17:10 Tutorial: Jets at LHC (2) - Frederik Ruehr (University of Heidelberg)	17:10 Tutorial: Monte Carlo (2) - Stefan Gieseke (Universitaet Karlsruhe)	17:10 Tutorial: Searches and statistics (2) - Ivor Fleck (Siegen)	
	17:20 Tutorial: ROOT (2) - Kevin Kroeninger (University of Goettingen)				

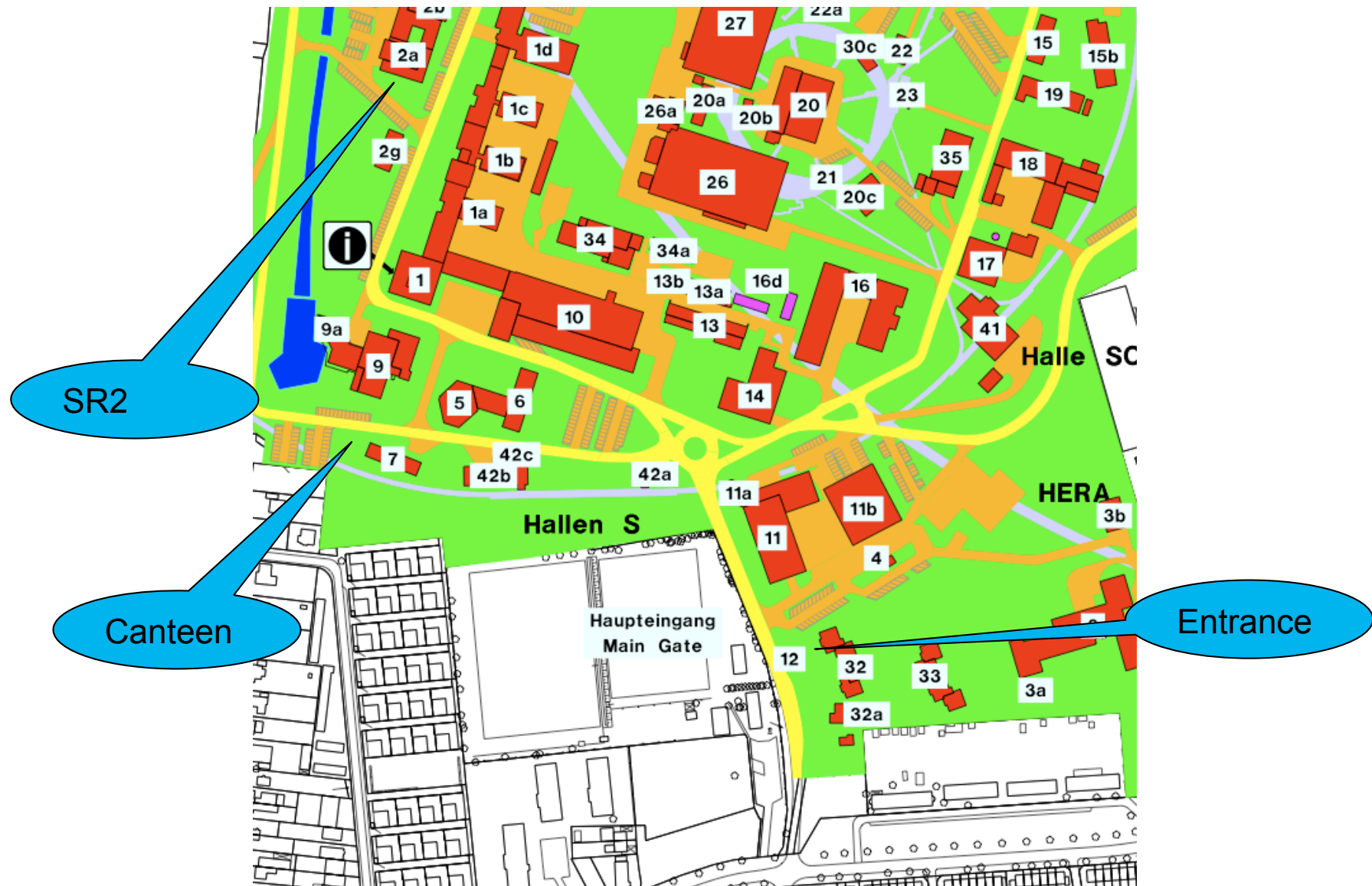
Reception!

Dinner!

ORGANISATIONAL ISSUES

- > If you have not yet registered: Please contact me or Mrs. Grimm.
- > This seminar room is our home for the week.
 - Also booked SR 5 for student work, as quiet room etc.
- > We ask you to keep screens of desktop machines and laptops off during lectures.
- > We provided a WLAN for all; information on that has been handed out.
- > Tutorials on the desktop machines; accounts have been handed out.
 - Please note that the work is performed in pairs – two students share one PC.
 - We don't have many supervisors – have to see how it works out.
- > Reception and dinner are in the canteen appendix.
 - Reception: Monday 19:30, Dinner: Wednesday 19:30
 - Lunches and breakfast can be taken in the canteen as well.
 - Evenings: I'd suggest going downtown. Ask your Hamburg fellow students for ideas (and drag them along).

ORGANISATIONAL ISSUES



STUDENT PRESENTATIONS

- Each tutorial shall be especially observed, documented and reported on (in the Friday morning session) by a team of ~three students.
 - Several benefits: these three will pay special attention, repetition of material for all colleagues, improving your presentation and documentation skills, etc.
 - We ask for volunteers, otherwise we will volunteer teams.
 - You can use any technology you like that you find installed somewhere: Linux, windows, Apple, ... Tex, Powerpoint, Keynote, ...
 - Idea: Summarise task, results, main messages for colleagues.

THANKS TO

- > ... to your home institutes
 - ... for contributing to the budget and sending you here!
- > ... to DESY
 - ... for hosting us!
- > ... to the Helmholtz Alliance (see last slide)
 - ... for the money and the framework!
- > ... to all lecturers and tutors
 - ... for their immense work!
- > ... and finally to all people behind the scenery which are necessary to put things in place:
 - Secretaries, technicians, DESY IT, ...

THE HELMHOLTZ ALLIANCE

“PHYSICS AT THE TERASCALE”

