

Welcome to GridKa School 2017 make science && run

Dr. Manuel Giffels 28.08.2017

Karlsruhe Institute of Technology Institute of Experimental Particle Physics & Steinbuch Center for Computing







Broad Range of Topics



Manuel Giffels

Speakers & Tutors

Dense Schedule:

- 21 plenary talks
- 1 evening lecture



Morning Sessions: Plenary talks FTU Aula

16 hands-on tutorials 39 speaker and tutors



Afternoon Sessions: Hands-on tutorials FTU seminar rooms





Collaboration



KIT | ETP & SCC

Contributions from many institutions:



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Participants

More than 120 registered participants

from different fields of science and industry

from 10 different countries



GridKa School Location



All lectures and tutorials are in the FTU (Training Center of KIT), which is the building where you currently are

All lectures take place in the Aula

FTU

Aula





Location

- Coffee will be served in Aula and in front of the seminar rooms
- Plenary Talks take place in Aula
 - Hands-on tutorials take place in Aula and seminar rooms 156, 157, 162, 163 and 164
- Electronic door plates will guide you
- School Office in room 155
 - Central place for help, questions, printing, requests, ...



Ingrid Schäffner



Melanie Ernst

FTU Site Map



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Lunch & Site Access

- Lunch is available at the KIT Canteen located <u>_on-site</u>"
- Modern building next to the main gate
- To enter the site you <u>have to</u> <u>show</u> your <u>GridKa School badge</u> to pass the guards at main gate
- Please do not forget your badge in the hotel! <u>No access/lunch without your</u> <u>badge!</u>
- Regulations require your birthday/ place to enter the site (asked during registration process)



Lunch & Guest Cards





Entrance to the left (Vending machines)

Entrance to the right

- Need a rechargeable guest card for cashless paying
- Guest cards pre-charged with 10 € included in your welcome package
- Please return guest cards before leaving GridKa School



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LSDMA: Symposium



The 6th International LSDMA Symposium "The Challenge of Big Data in Science" co-located with GridKa School on Tuesday, August 29th

Registration	
Foyer, FTU, KIT	08:30 - 09:00
Welcome to LSDMA Symposium	DECKER, Michael
Aula, FTU, KIT	09:00 - 09:20
The NFFA Europe Information and Data Repository Platform	COZZINI, Stefano
Aula, FTU, KIT	09:20 - 09:50
Towards the Fenix Infrastructure	PLEITER, Dirk
Aula, FTU, KIT	09:50 - 10:20
Coffee Break	
Foyer, FTU, KIT	10:20 - 10:50
AI-driven decision automation in physics research and enterprises	FEINDT, Michael
Aula, FTU, KIT	10:50 - 11:20
Helix Nebula Science Cloud	FERNANDES, João
Aula, FTU, KIT	11:20 - 11:50
Lunch Break	
Foyer, FTU, KIT	11:50 - 12:50
Accelerating Storage System Research Through a Common Framework	KUHN, Michael
Aula, FTU, KIT	12:50 - 13:20
Research Data and Management in Environmental Sciences - Characteristics, Status and BERNARD, Lars Challenges	
Conclusion	STREIT, Achim
Aula, FTU, KIT	13:50 - 14:00

Joined plenary session GridKa School & LSDMA Symposium (09:00 - 14:00)

46 additional participants

Lunch (Fingerfood) will be served at FTU on Tuesday!

Virtual School Infrastructure



Available Compute Resources:

- OpenStack cloud on 3 racks
- 82 hypervisors
- 3 controllers
- 5 VLAN Software Defined Network
 - 1328 CPU cores
- 1.9 TB memory
- 320 TB shared IBM Sonas storage
- GPU cluster at FZ Jülich (JURON)
- GPU cluster at RWTH Aachen
- Resources provided by INOVEX
- bwUniCluster (KIT) External

Preslav Konstantinov



Samuel Ambroj

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Tuesday Evening (~18:30):

Guided Computing Center Tour

Tarte Flambee Evening at SCC

We will meet at FTU right after the tutorials (~18:20) and go all together to SCC

Wednesday Evening (~18:30):

Evening Lecture by Prof. Blatt (University of Innsbruck) "The Quantum Way of Doing Computations"

Thursday Evening (20:00):

School Dinner at Leonardo Hotel

500m from central station



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The Quantum Way of Doing Computations



Prof. Dr. Rainer Blatt Institute for Quantum Optics and Quantum Information Austrian Academy of Sciences

Wednesday 30 August 18:30 KIT Campus North - FTU Aula

Joint GridKa School and SCC-Colloquium

Abstract:

Since the mid-nineties of the 20th century, it became apparent that one of the centuries' most important technological inventions, that is computers in general, and many of their applications can be further enhanced by using operations based on quantum physics. This is timely since the classical roadmap for the development of computational devices, commonly known as Moore's law, will cease to be applicable within the next decade. This is due to the ever-smaller sizes of electronic components that soon will enter the quantum physics realm. Computations, whether they happen in our heads or with any computational device, always rely on real physical processes, which are data input, data representation in a memory, data manipulation using algorithms and finally, the data output. Building a quantum computer then requires the implementation of quantum bits (qubits) as storage sites for quantum information, quantum registers and quantum gates for data handling and processing and the development of quantum algorithms. In this talk, the basic functional principle of a quantum computer will be reviewed. It will be shown how strings of trapped ions can be used to build a quantum information processor and how basic computations can be performed using quantum techniques. Routes towards a scalable quantum computer will be discussed.

About the speaker:

Rainer Blatt is Professor of experimental physics at the University of Innsbruck, Austria, and Scientific Director at the Institute for Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Sciences (OAW). He has carried out trail-blazing experiments in the fields of precision spectroscopy, quantum metrology and quantum information processing. In 2004 Blatt's research group succeeded for the first time in transferring the quantum information of one atom in a totally controlled manner onto another atom (teleportation). Two years later, his group already managed to entangle up to eight atoms in a controlled manner. Creating such a first "quantum byte" was a further step on the way towards a quantum computer. He has received numerous awards for his achievements in the fields of quantum



optics and meteorology. In 2012 the German Physical Society awarded him the Bens of quantum with Ignacio Cirac he won the 2009 Carl Zeiss Research Award. He also received a Humboldt Research Award (2013) and an ERC Advanced Grant by the European Research Council (2008).

In 2013 the Australian Academy of Science announced Rainer Blatt as the 2013 Frew Fellow. In 2014 he was awarded the "Tiroler Landespreis fur Wissenschaft 2014 and in 2015 the Stewart Bell Prize for Research on Fundamental Issues in Quantum Mechanics and their Applications. Rainer Blatt is full member of the Austrian Academy of Sciences.

KIT - The Research University in the Helmholtz Association

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Bus Shuttle



Connection between Leonardo Hotel and FTU

- Detailed schedule can be found at <u>https://indico.scc.kit.edu/indico/upload/GKS-Infosheet-2017.pdf</u>
- Today bus leaves around 18:00 in front of FTU
- Tomorrow bus leaves at 08:15 at Leonardo Hotel
- Transfer back at 22:00 in front of the SCC after Tarte Flambee Event





Bus Stop Close to Leonardo



GridKa School @ WikiToLearn



wikitolearn

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GridKa2017

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Scientific Workflows with FireWorks

Scientific workflow is an important technique used in many simulation and data analysis applications. In particular, workflows automate high-throughput / high-complexity computing applications, enable code and data reuse and provenance, provide methods for validation and error tracking, and exploit application concurrency using distributed computing resources. The goal of this tutorial is to learn composing and running workflow applications using the FireWorks workflow environment (FireWorks).

Elasticsearch, Logstash, Kibana hands-on

The aim of this tutorial is to prepare participants for own deployment of the ELK stack for collecting and log analysis. Participants will be taken step by step through installation, configuration and use of all needed tools for modern log analysis.

Introduction to Erlang

Explaining the basic concepts of the Erlang programming language and testing these by a simple game using Erlang.

Supervised Machine Learning with Deep Neural Networks

Machine learning with deep neural networks has seen tremendous advances in the last few years and is now the state-of-the-art method in a broad range of fields, including computer vision and natural language processing.

Check WikiToLearn for hands-on tutorials requirements https://en.wikitolearn.org/GridKa2017

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Program Changes





In case you are still registered for this tutorial and would like to attend another one, please let us know at <u>GridKa-School@scc.kit.edu</u>

GridKa School Survey



We are very interested in your feedback - Please spend a few minutes a day to fill our survey

For each day you will get a link to the survey by email

No registration needed, no logging, completely anonymous

GridKa School 2017: Day 1: Monday	
Welcome to the GridKa School survey page. The only goal of this survey is to keep the technical program of the school at highest quality and make it even more attractive and exciting.	
Please grade only sessions you have attended. If you have not attended a session or missed a talk, just leave the question unanswered.	
These on 5 questions in this quest.	Sorry, no picture available
There are 5 questions in this survey.	
Load unfinished survey Next > Exit and clear survey	Eileen Kühn

Further Information



Group Picture:

Will be taken on Wednesday before the lunch break (~12:00) in front of the FTU

Wireless:

vpn/web/belwue (information in your welcome package)

eduroam

Available in all rooms

In case you have any questions:

School Office in 155

Send mail to <u>GridKa-School@scc.kit.edu</u>

Ask me directly

Sightseeing Karlsruhe





Many construction zones!

Manuel Giffels



Sightseeing Karlsruhe





Many construction zones!



But also beautiful places!



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Lightshow Karlsruhe Palace



////// **| < | | |** zkm karlsruhe KARLSRUHE EVENTGMBH facebook ē. KARLSRUHE | 3. AUGUST BIS 10. SEPTEMBER 2017 **SCHLOSSLICHTSPIELE** - EINTRITT FREI -http://www.schlosslichtspiele.info Every day from 21:00 - 23:30 SCHLOSSLICHTSPIELE PROGRAMM KÜNSTLER DE EN FR PARTNER VERANSTALTUNGEN IMPRESSIONEN ANREISE



Many Thanks to all our partners!



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Let's start

We wish you an interesting and pleasant school week!

