

# Welcome to GridKa School 2016

## Data Science on Modern Architectures

**Dr. Manuel Giffels**  
**29.08.2016**

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

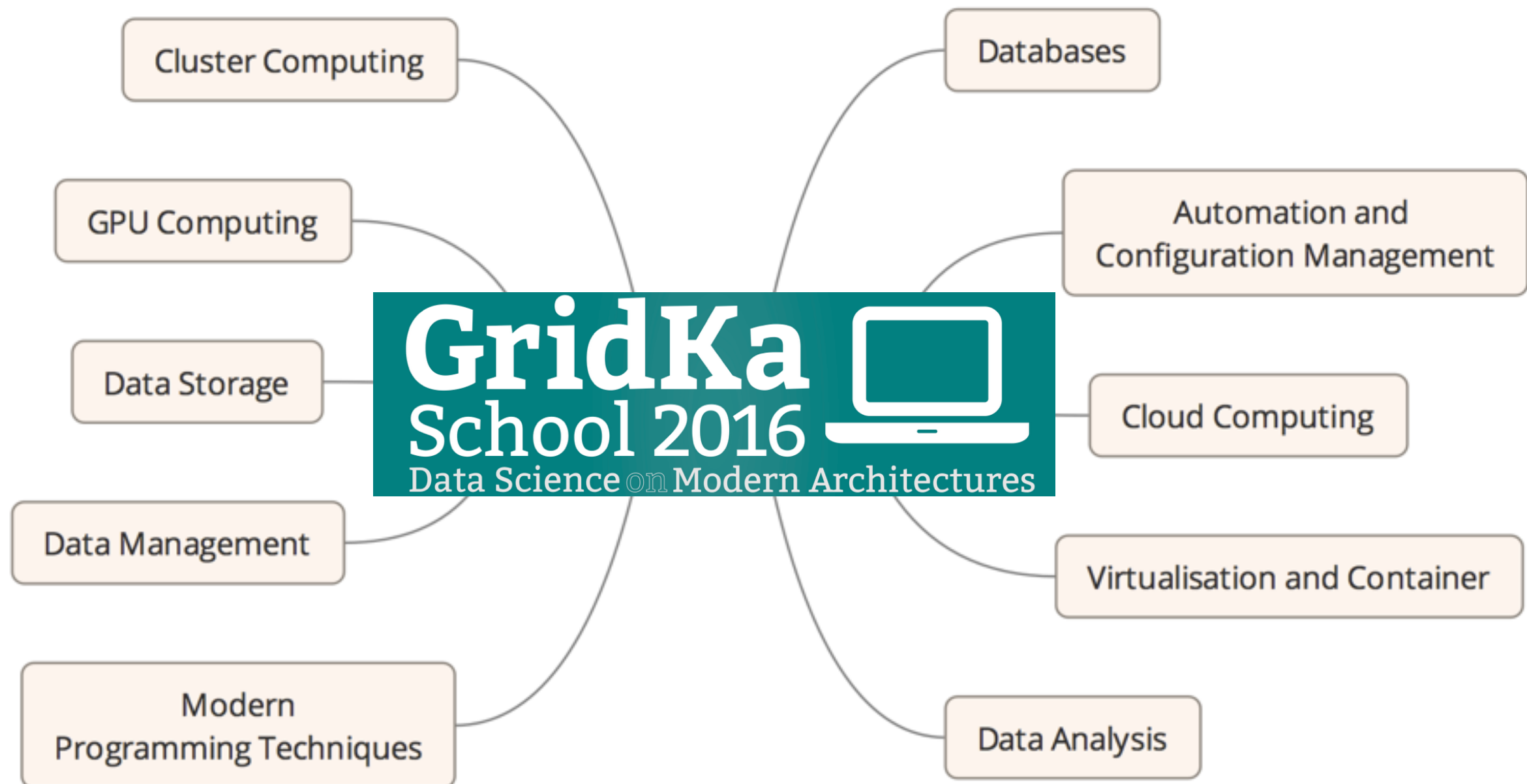
# GridKa

# School 2016



## Data Science on Modern Architectures

# Broad Range of Topics



# Speakers & Tutors

## Dense Schedule:

- 19 plenary talks
- 1 evening lecture

- 16 hands-on tutorials
- 40 speaker and tutors



## Morning Sessions:

- Plenary talks
- FTU Aula






















## Afternoon Sessions:

- Hands-on tutorials
- FTU seminar rooms

# Collaboration

## Contributions from many institutions:

- |                                                                                                                |                                                                                                             |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|  Amazon                       |  Hitachi                 |
|  CERN                         |  IBM                     |
|  Cloudera                     |  KIT                     |
|  DESY                         |  LPC                     |
|  DKFZ Heidelberg              |  Mapbox                  |
|  DLR                          |  RAL                     |
|  EPFL                        |  RDA                    |
|  FZ Jülich                  |  University of Glasgow |
|  Hewlett-Packard Enterprise |  University Göttingen  |
|  Helix Nebula Science Cloud |                                                                                                             |



Thank you!



# Participants

About 130 registered participants

- from different fields of science and industry
- from 13 different countries



Group Photo GridKa School 2015 - Eileen Kühn

# 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



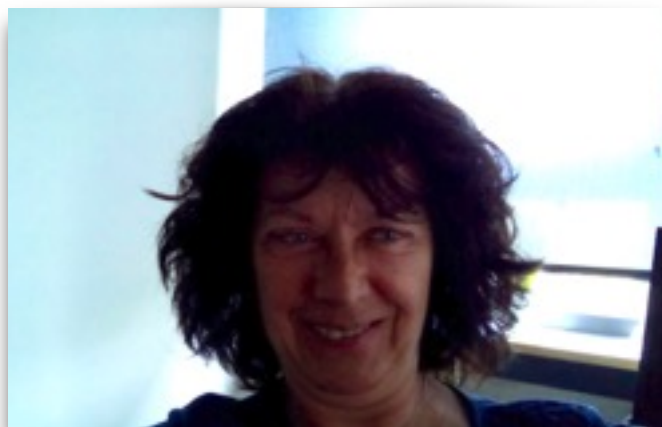
## Aula





# 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 155, 156, 157, 164 and 162
- Electronic door plates will guide you
- **School Office** in room 116
  - Central place for help, questions, printing, requests, ...



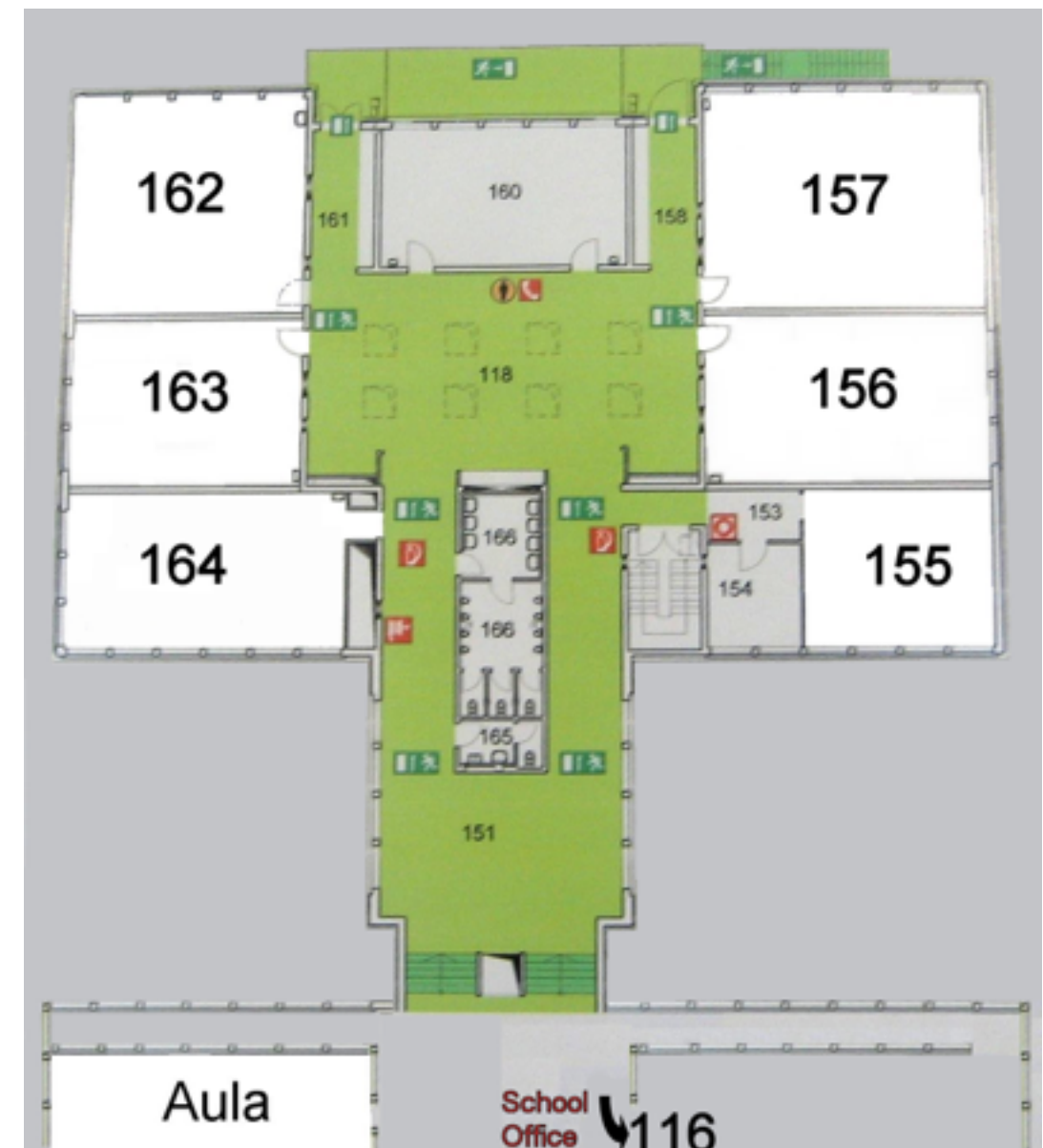
Ingrid Schöffner



Melanie Ernst

Manuel Giffels

FTU Site Map



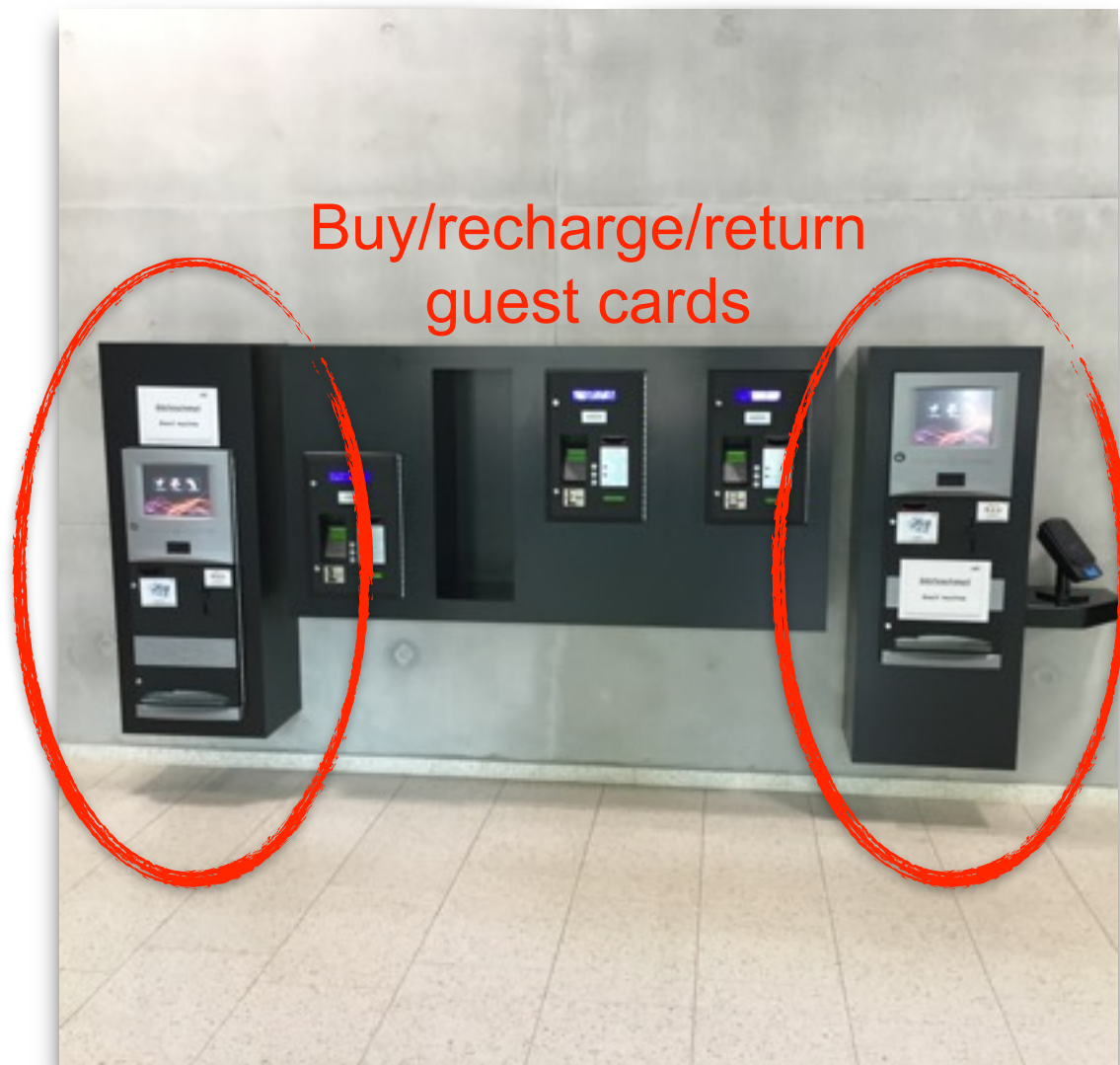
# Lunch & Site Access

- Lunch is available at the KIT Canteen located „on-site“
- Modern building next to the main gate
- To enter the site you have to show your GridKa School badge to pass the guards at main gate
- Please, do not forget your badge in the hotel!  
**No access/lunch without your badge!**
- 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 available for 10 € at the school office or at vending machines in the canteen
- 2.50 € deposit (will be returned) + 7.50 € credit (~1 meal)



# 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
- VMs at DESY
- GPU cluster at KIT - IPE



Preslav Konstantinov



Samuel Ambroj

# Evening Program

## Tuesday Evening (~18:30):

- Guided Computing Center Tour
- Tarte Flambee Evening at SCC
- Live Music
- We will meet at FTU right after the tutorials (~18:05) and go all together to SCC

## Wednesday Evening (~18:30):

- Evening Lecture by Prof. Köster (DLR)  
*„Automated and Connected Driving  
from a User-Centric Viewpoint“*

## Thursday Evening (20:00):

- School Dinner at Leonardo Hotel
- 500m from central station



# Evening Program

## Tuesday Evening (~18:30):

- Guided Computing Center Tour
- Tarte Flambee Evening at SCC
- Live Music
- We will meet at FTU right after the tutorials (~18:05) and go all together to SCC

## Wednesday Evening (~18:30):

- Evening Lecture by Prof. Köster (DLR)  
*„Automated and Connected Driving  
from a User-Centric Viewpoint“*

## Thursday Evening (20:00):

- School Dinner at Leonardo Hotel
- 500m from central station



# Evening Program

## Tuesday Evening (~18:30):

- Guided Computing Center Tour
- Tarte Flambee Evening at SCC
- Live Music
- We will meet at FTU right after the tutorials (~18:05) and go all together to SCC

## Wednesday Evening (~18:30):

- Evening Lecture by Prof. Köster (DLR)  
*„Automated and Connected Driving  
from a User-Centric Viewpoint“*

## Thursday Evening (20:00):

- School Dinner at Leonardo Hotel
- 500m from central station



# Evening Program

## Tuesday Evening (~18:30):

- Guided Computing Center Tour
- Tarte Flambee Evening at SCC
- Live Music
- We will meet at FTU right after the tutorials (~18:05) and go all together to SCC

## Wednesday Evening (~18:30):

- Evening Lecture by Prof. Köster (DLR)  
*„Automated and Connected Driving from a User-Centric Viewpoint“*

## Thursday Evening (20:00):

- School Dinner at Leonardo Hotel
- 500m from central station

### Automated and Connected Driving from a User-Centric Viewpoint



**Prof. Dr. Frank Köster**  
Deutsches Zentrum für Luft- und Raumfahrt (DLR)  
**Wednesday 31 August 18:30**  
**KIT Campus North - FTU Aula**

Joint GridKa School and SCC-Colloquium

#### Abstract:

Automated and connected driving can be seen as a paradigm shift in the automotive domain which will change the today's role of the human driver substantially. More and more parts of the driving task are to be taken over by technical components for different scenarios. The application areas reach from fully automated parking up to automated driving on a highway with different involvements of the driver in monitoring tasks (SAE level 2 to 5). Thus, it is essential to understand how this role change will influence the human driver and how we can support him by designing an easy to understand, safe and comfortable interaction with the automated vehicle.

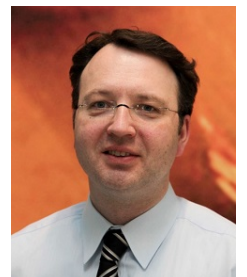
From Human Factors research we know that it is crucial to ensure that the driver has a correct mental model about the automation levels and its current status to avoid mode confusion and resulting errors in operation. In addition, transitions of control between the driver and the automated vehicle need a careful design that is adjusted to the current traffic situation and the driver status. For example, mobile devices that the driver uses during the automated driving can be integrated smoothly in the overall interaction design concept to support transitions.

The talk will give an overview on selected research topics in the area of user-centric development of automated and connected vehicles at DLR. It will underline why it is important to put the human into focus when designing a new, exciting technology such as automated and connected vehicles.

#### About the speaker:

Prof. Dr. Frank Köster is currently head of the "Automotive Systems" department at DLR (Deutsches Zentrum für Luft- und Raumfahrt) and Professor for "Intelligent Transport Systems" at the University of Oldenburg. He studied computer science at the University of Oldenburg where he graduated in 2001 and habilitated in 2007.

Frank Köster is a member of the round table "Autonomous Driving" of the Federal Ministry of Transport and Digital Infrastructure, representative of the DLR in various national and international committees and organizations like SafeTrans and ERTICO as well as referee of research projects, journals and congresses concerning autonomous and connected driving.





# Evening Program

## Tuesday Evening (~18:30):

- Guided Computing Center Tour
- Tarte Flambee Evening at SCC
- Live Music
- We will meet at FTU right after the tutorials (~18:05) and go all together to SCC



## Wednesday Evening (~18:30):

- Evening Lecture by Prof. Köster (DLR)  
*„Automated and Connected Driving  
from a User-Centric Viewpoint“*

## Thursday Evening (20:00):

- School Dinner at Leonardo Hotel
- 500m from central station

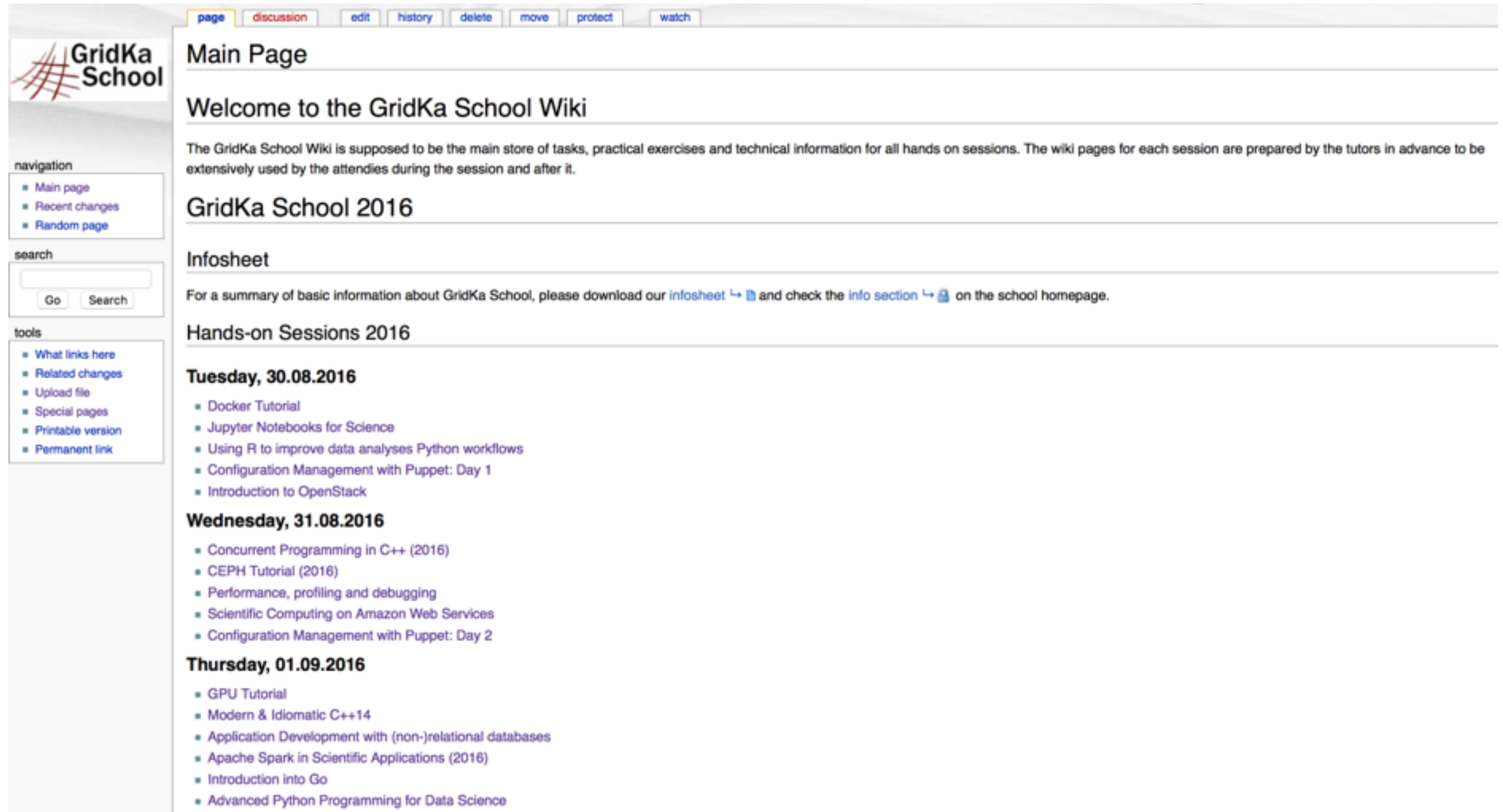


# Bus Shuttle

- Connection between Leonardo Hotel and FTU
- Detailed schedule can be found at <https://wiki.scc.kit.edu/gridkaschool/upload/7/70/GKS-Infosheet-2016.pdf>
- 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



# GridKa School Wiki



The screenshot shows the main page of the GridKa School Wiki. At the top, there is a navigation bar with tabs: page, discussion, edit, history, delete, move, protect, and watch. The left sidebar contains a 'GridKa School' logo, a 'navigation' section with links to Main page, Recent changes, and Random page; a 'search' section with a search box and buttons for Go and Search; and a 'tools' section with links for What links here, Related changes, Upload file, Special pages, Printable version, and Permanent link. The main content area is titled 'Main Page' and 'Welcome to the GridKa School Wiki'. It includes a paragraph explaining the wiki's purpose and a section for 'GridKa School 2016' with an 'Infosheet' link. Below this, there is a section for 'Hands-on Sessions 2016' listing sessions for Tuesday, 30.08.2016; Wednesday, 31.08.2016; and Thursday, 01.09.2016, each with a list of topics.

**Main Page**

Welcome to the GridKa School Wiki

The GridKa School Wiki is supposed to be the main store of tasks, practical exercises and technical information for all hands on sessions. The wiki pages for each session are prepared by the tutors in advance to be extensively used by the attendees during the session and after it.

**GridKa School 2016**

**Infosheet**

For a summary of basic information about GridKa School, please download our [infosheet](#) and check the [info section](#) on the school homepage.

**Hands-on Sessions 2016**

**Tuesday, 30.08.2016**

- Docker Tutorial
- Jupyter Notebooks for Science
- Using R to improve data analyses Python workflows
- Configuration Management with Puppet: Day 1
- Introduction to OpenStack

**Wednesday, 31.08.2016**

- Concurrent Programming in C++ (2016)
- CEPH Tutorial (2016)
- Performance, profiling and debugging
- Scientific Computing on Amazon Web Services
- Configuration Management with Puppet: Day 2

**Thursday, 01.09.2016**

- GPU Tutorial
- Modern & Idiomatic C++14
- Application Development with (non-)relational databases
- Apache Spark in Scientific Applications (2016)
- Introduction into Go
- Advanced Python Programming for Data Science

Check GridKa School Wiki for hands-on tutorials requirements  
[https://wiki.scc.kit.edu/gridkaschool/index.php/Main\\_Page](https://wiki.scc.kit.edu/gridkaschool/index.php/Main_Page)



# Program Changes

Thursday, 01 September, 2016

Plenary talks

Aula

09:00 **Architectural Patterns for Big-Data Applications on Hadoop**  
Mirko Kämpf (Cloudera)

Thursday, 01 September, 2016

Plenary talks

Aula

09:00 **Big Data in Biology**  
Dr. Alexander Schug (KIT)

Tuesday, 30 August, 2016

Parallel Sessions

(from 13:00 until 18:00)

Docker Tutorial

Room 156

Jupyter Notebooks for Science  
(ROOT as a Service)

Room 163

Using R to improve data analyses  
Python workflows

Aula

Puppet I

Room 155

Introduction to OpenStack

Room 157

Tuesday, 30 August, 2016

Parallel Sessions

(from 13:00 until 18:00)

~~Docker Tutorial~~

Room 157

Jupyter Notebooks for Science  
(ROOT as a Service)

Room 163

Using R to improve data analyses  
Python workflows

Aula

Puppet I

Room 155

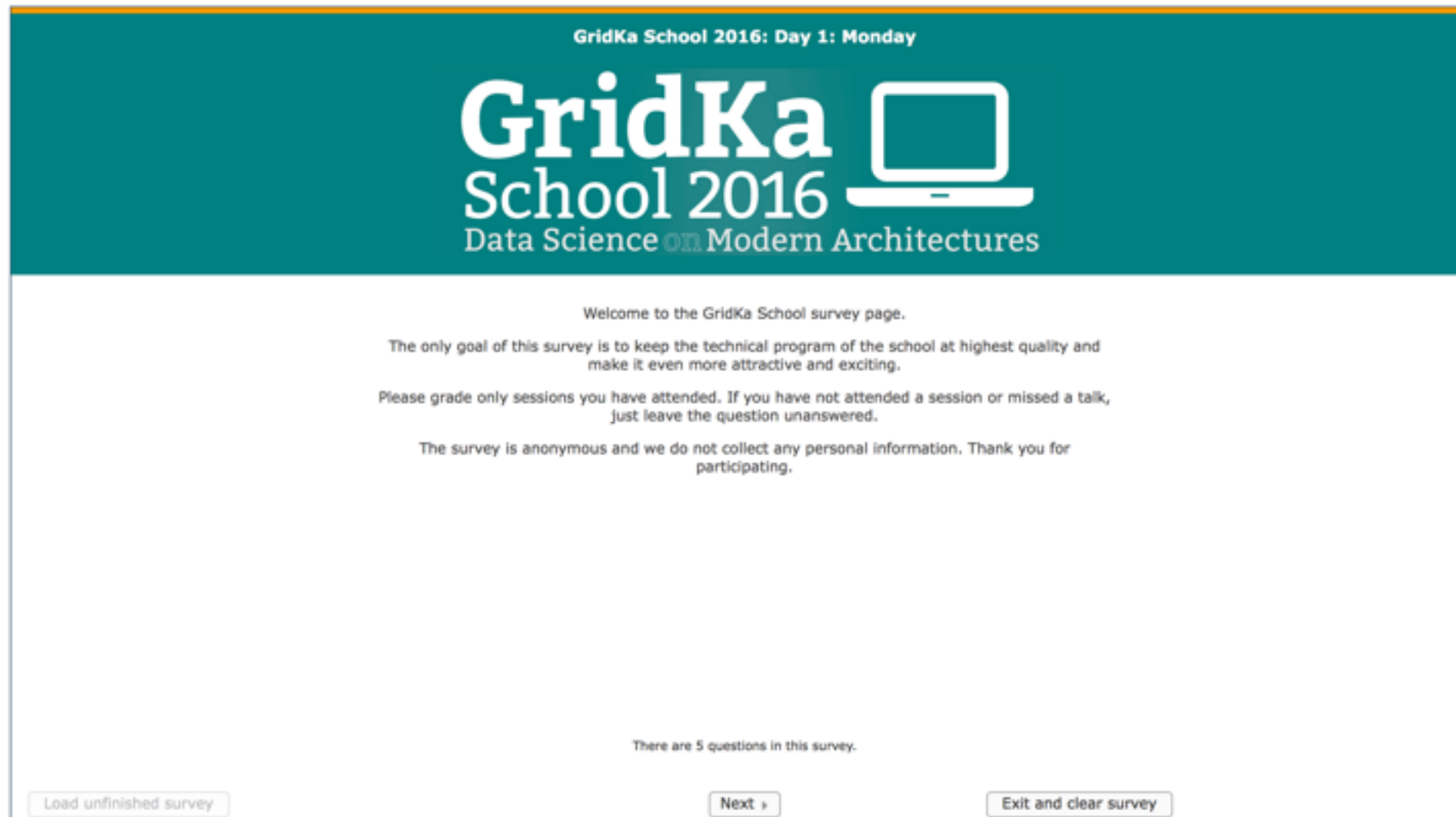
~~Introduction to OpenStack~~

Room 156

Change of tutorial location on Thursday!

# 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 2016: Day 1: Monday

## GridKa School 2016

Data Science on Modern Architectures

Welcome to the GridKa School survey page.

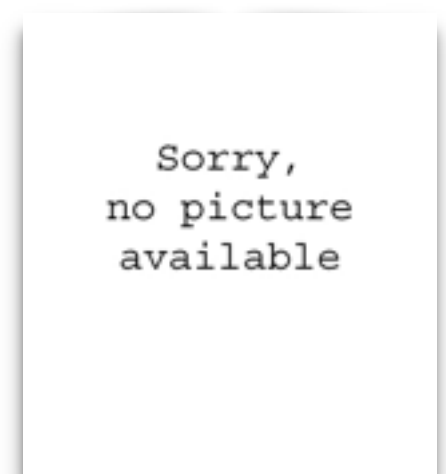
The only goal of this survey is to keep the technical program of the school at highest quality and make it even more attractive and exciting.

Please grade only sessions you have attended. If you have not attended a session or missed a talk, just leave the question unanswered.

The survey is anonymous and we do not collect any personal information. Thank you for participating.

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 school bag)
- eduroam
- Available in all rooms

## In case you have any questions:

- School Office in 116
- Send mail to [GridKa-School@scc.kit.edu](mailto:GridKa-School@scc.kit.edu)
- Ask me directly



# Sightseeing Karlsruhe



Many construction zones!



# Sightseeing Karlsruhe

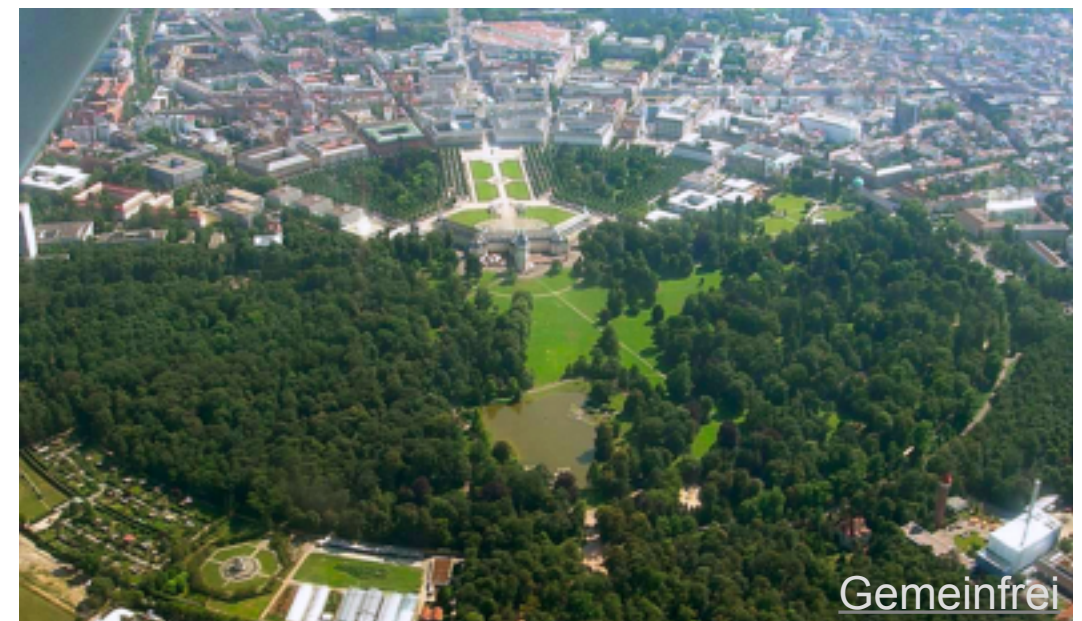


Many construction zones!



Group Photo GridKa School 2015 - Eileen Kühn

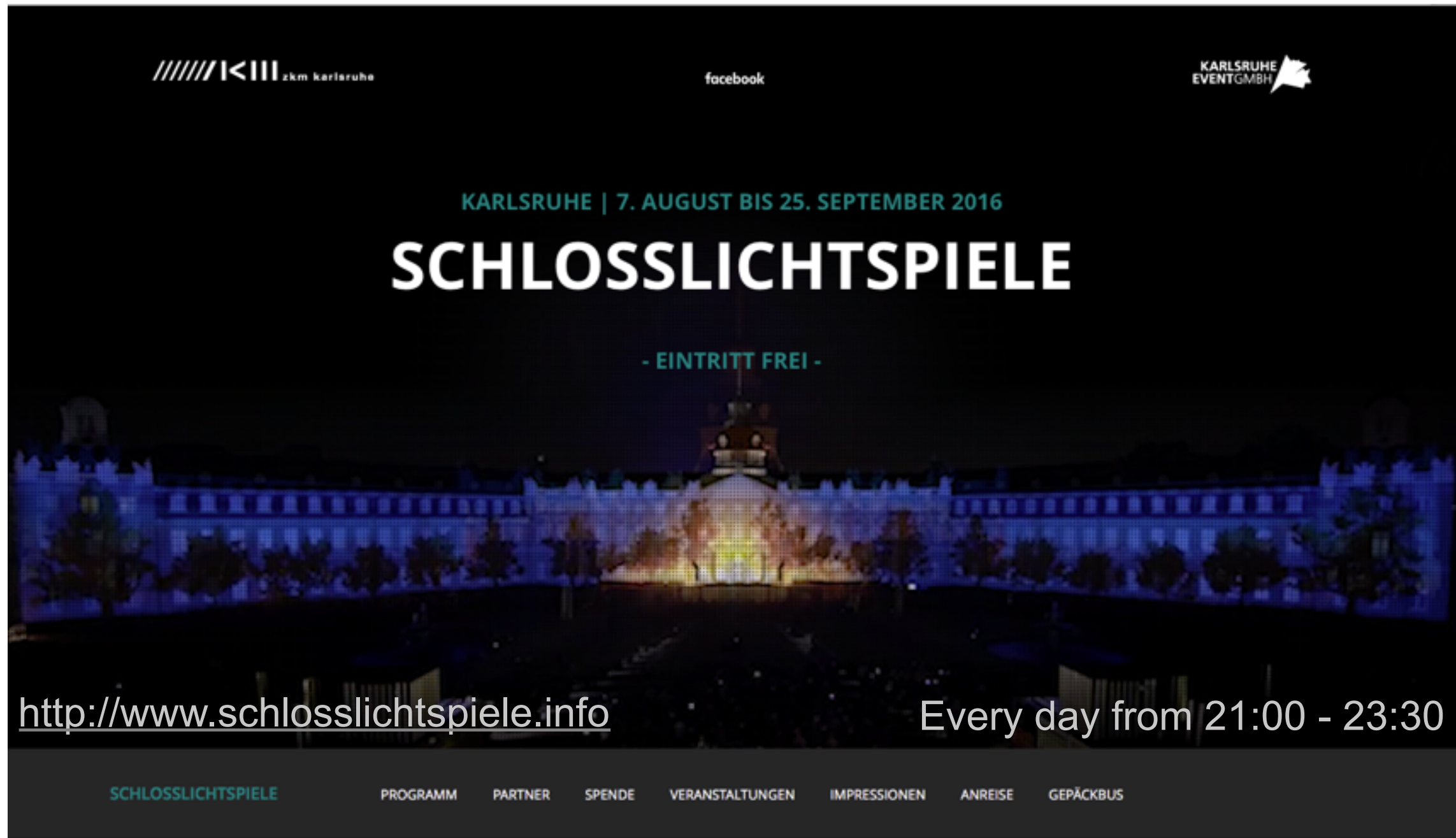
But also beautiful places!



Gemeinfrei



# Lightshow Karlsruhe Palace



The banner features a night photograph of the Karlsruhe Palace illuminated with blue and yellow lights. The text is overlaid on the image.

//////KIII zkm karlsruhe      facebook      KARLSRUHE EVENTGMBH

KARLSRUHE | 7. AUGUST BIS 25. SEPTEMBER 2016

## SCHLOSSLICHTSPIELE

- EINTRITT FREI -

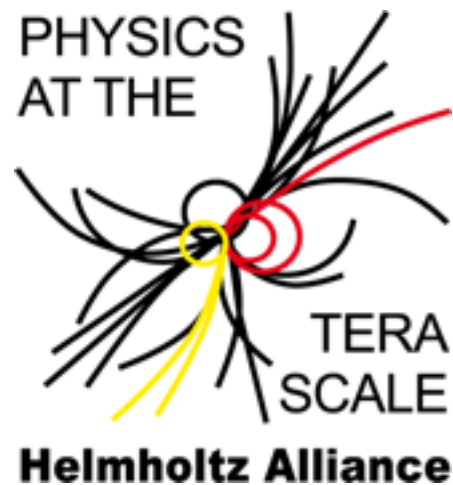
<http://www.schlosslichtspiele.info>      Every day from 21:00 - 23:30

SCHLOSSLICHTSPIELE    PROGRAMM    PARTNER    SPENDE    VERANSTALTUNGEN    IMPRESSIONEN    ANREISE    GEPÄCKBUS

SCHLOSSLICHTSPIELE 2016  
DIE SPEKTAKULÄRE LICHTSHOW VOR DEM KARLSRUHER SCHLOSS



# Many Thanks to all our partners!



**Hewlett Packard  
Enterprise**

**HITACHI**  
Inspire the Next

Hitachi Data Systems

# Let's start



We wish you an interesting and pleasant school week!