

# Introduction to the Steinbuch Centre for Computing (SCC)

Achim Streit

Steinbuch Centre for Computing



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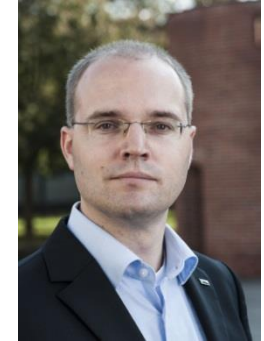
- The Information Technology Center of KIT

## Science for Services – Services for Science

- Promotion of research, innovation, teaching, studying, higher education and administration at KIT by excellent IT-services
- R&D&I in Secure IT-Federations, Supercomputing and Big Data
  - For KIT, the State of Baden-Württemberg, and national and international research communities
  - Covering HPC & Data Intensive Computing, Computational Science and Engineering, Grids, Clouds, Large Scale Data Management & Analysis

# Facts and Figures

- Board of directors
  - Prof. Dr. Hannes Hartenstein
  - Prof. Dr. Bernhard Neumair
  - Prof. Dr. Achim Streit
- ~200 employees in total
  - 50% scientists, 50% technicians, administrative personnel, trainees
  - 9 departments and 5 research groups
- Two locations at KIT Campus South and North
- Founded on January 1st, 2008
  - Merger of the Computing Centers of former Karlsruhe University (URZ) and Research Center Karlsruhe (IWR)
- Karl Steinbuch
  - Professor at Karlsruhe University, creator of the term “Informatik”, co-founder of the first German faculty of informatics



# Secure IT-Federations

## ■ Grid Reserach

- Grid Infrastructure projects on regional, national and EU level
- GGUS: Global Grid User Support
  - Central helpdesk framework for global Grid users
  - Synchronization of more than 20 regional helpdesk systems worldwide
  - Developed at and operated by SCC since 2003



## ■ bwIDM: Federated identity and access management in the state of Baden-Württemberg

- A basis for location-independent use and provisioning of IT services

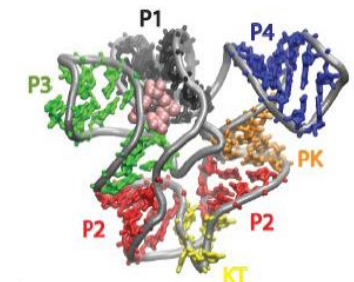
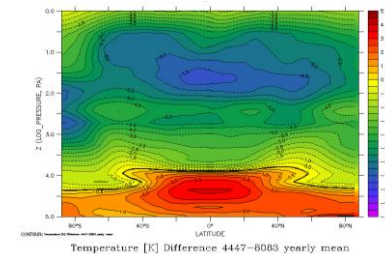
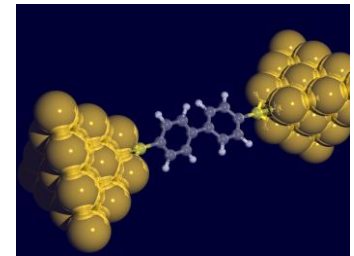
## ■ Cloud Research

- Cloud Systems Research: HPC as a Service, Inter-Cloud Brokering , Cloud Service Bus, Management Tools, Hadoop
- Cloud Computing Projects: Software-Cluster, Peer Energy Cloud



# Supercomputing

- SCC operates large HPC systems for KIT and the State of Baden-Württemberg
  - IC2, HC3, *bwUniCluster*, *ForHLR*
  - Overall 9500 + 8500 cores
- SCC has established simulation laboratories (SimLabs)
  - Joint R&D with scientific communities
    - **NanoMikro, Climate and Environment, Energy, Elementary Particle and Astroparticle Physics**
  - Application enabling and scaling of simulation codes on modern HPC architectures
  - Support in access and usage of facilities of most powerful HPC infrastructures in Europe
- R&D on exa-scale technologies, e.g. DFG project DASH
- Helmholtz Young Investigator Group at SCC on **Multiscale Biomolecular Simulation**



# Big Data

## ■ Our asset: **GridKa**

- German Tier-1 center in the Worldwide LHC Computing Grid
- Current status: 11,600 CPU cores, 11 PB disk, 17 PB tape, Grid services
- Enables German and European research groups to explore LHC data



## ■ The next “big thing”: **LSDF** – Large Scale Data Facility

- BaWü storage facility, available to all scientific disciplines
- Current use: systems biology, satellite and synchrotron data
- Current status: 6 PB installed, 110 TB Hadoop, extension to > 10 PB
- Development of data services, e.g. file sync&share, data-handling



## ■ R&D: **Large Scale Data Management and Analysis**

- Joint R&D in Data Life Cycle Labs (DLCL)
- Research on general methods and tools development
  - Data management, AAI/IDM, archiving
- Consortium: 4 Helmholtz, 6 Universities + DKRZ

