Introduction to the Steinbuch Centre for Computing (SCC)

Achim Streit
Steinbuch Centre for Computing (SCC)

- 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 Research**
  - 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