Karlsruhe Institute of Technology

RESEARCH – TEACHING – INNOVATION

Karlsruhe Institute of Technology (KIT)

One legal entity

The mission

The Research University in the Helmholtz Association

Three core tasks

Research   **Higher Education**   **Innovation**

Steinbuch Centre for Computing

KIT – Selected Facts and Figures
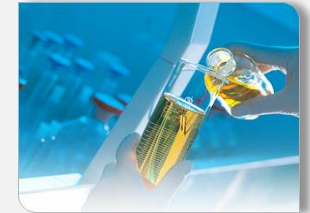
25.196 Students

9.315 Employees

5.859 Education and research
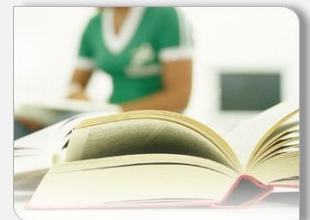
355 Professors

999 Foreign guest scientists
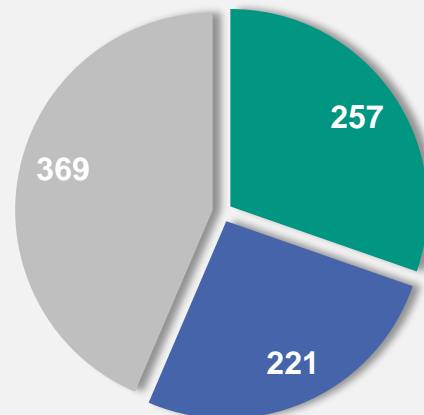
3.456 Infrastructure and services

471 Trainees

Research

Higher Education

KIT Budget 2014
€ 851 million

- 257 ■ Federal funds
- 221 ■ State funds
- 369 ■ Third-party funds

Innovation

Status of March 2016

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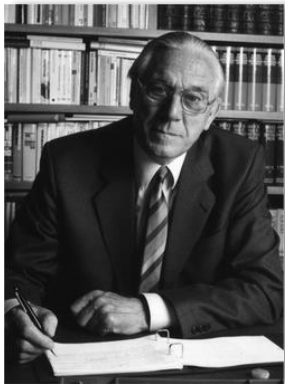
KIT – Tradition and Vision

The first E-Mail received in Germany
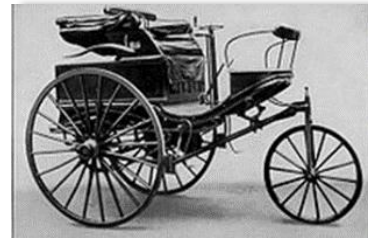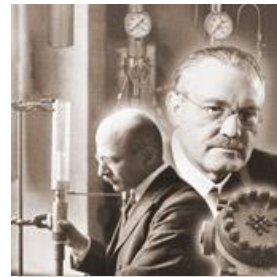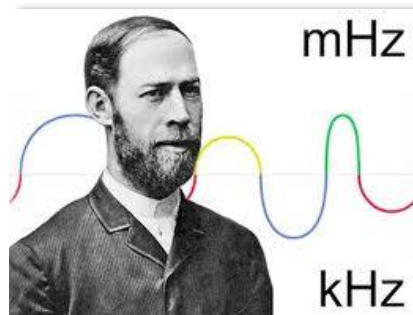
Carl Benz

The first Faculty of Informatics in Germany
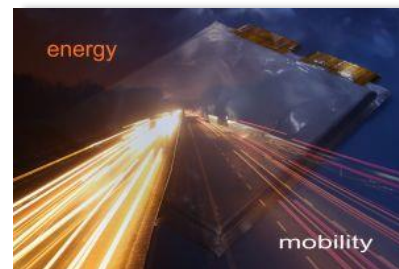
Karl Steinbuch

Fritz Haber

Heinrich Hertz

One of the largest energy research centers in Europe

Ferdinand Braun

Steinbuch Centre for Computing

Steinbuch Centre for Computing (SCC)

Steinbuch Centre for Computing

www.kit.edu

Steinbuch Centre for Computing

KIT
Karlsruhe Institute of Technology

Who are we?

Institute in KIT with service tasks

Which demands do we satisfy?

- Computational Science & Engineering (CSE)
- Data-Intensive Science (DIS)
- For users in KIT, BaWü, Germany and international

What do we do?

- Research, education and innovation in Supercomputing, Big Data and secure IT-federations
- Operation of large scale research facilities
- Operation of basic IT services

"Services for Science – Science for Services"

SCC   Steinbuch Centre for Computing

SCC IT-Services

- **Campus-wide IT-services** for > 25.000 students and > 10.000 employees

- **Networks:** 1700 switches/router, 1000 WLAN APs

- **Server virtualisation:** 800 virtual servers

- **HW server:** ca. 400 servers in 80 racks

- **Backup/archive:** 3000 Clients, 6 Libraries, 30000 Slots

- **E-Mail:** 45.000 mail boxes, 450.000 incoming mails/d, 200.000 outgoing mails/d

- **Databases:** ca. 1250 MS-SQL/Oracle DB

- **Web:** 600.000 web pages, 500 virt. web servers

- **Computer rooms:** 400 PCs, 250 courses

- **Portal for students/e-learning:** 8.000 users/d, 26.000 users/a, 8.300 active courses

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Enabling Data-Intensive Science (DIS)

- Operation of **GridKa**
  - German Tier-1 in WLCG for an international community
- Operation of the **Large-Scale Data Facility**
  - Multi-disciplinary data centre for climate research, systems biology, energy research, etc. in BaWü
- **Joint R&D&I** with scientific communities
  - Generic data management research
  - Data Life Cycle Labs in Helmholtz Programm SBD
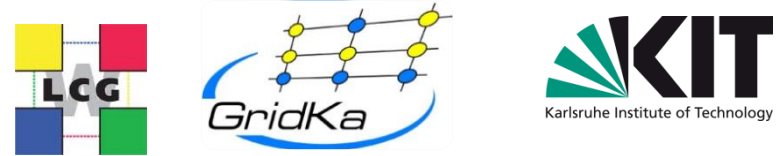- **Innovation driver** for SMEs, big industry und start-ups
- **Active role** in national and international projects & initiatives
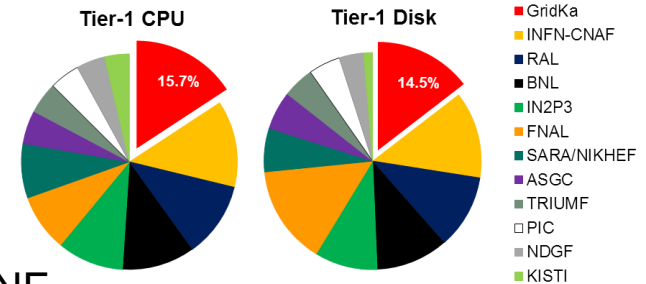
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GridKa

- **German Tier-1 Center in WLCG**
  - Supports all LHC experiments + Belle II + several small communities
- Resources
  - Computing: ~ 10.000 cores (160 kHS'06)
  - Disk: 14 PB (netto)
  - Tape: 18 PB (used)
  - 100 Gbit/s network connectivity to LHCOPN, LHCONE
- 14% of LHC data permanently stored at GridKa
- Among the largest and best performing T1s
- Annual international GridKa School
  - > 1400 participants in 13 years!
  - 2015: ~100 participants / 15 countries
- Global Grid User Support (GGUS) for WLCG
  - *If there is no ticket in GGUS, it is a not problem.*

Tier-1 CPU — 15.7% Tier-1 Disk — 14.5%

Legend: GridKa, INFN-CNAF, RAL, BNL, IN2P3, FNAL, SARA/NIKHEF, ASGC, TRIUMF, PIC, NDGF, KISTI

Reliability measured by WLCG
Jan 2011- Dec 2013

GridKa	99.5%
Ø other T1s	98.6%

SCC   Steinbuch Centre for Computing
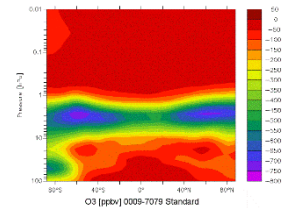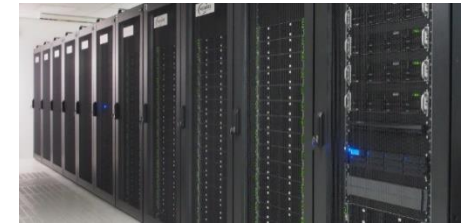
Enabling Computational Science & Engineering (CSE)

- Operation of **HPC systems**
  - **ForHLR:** Tier-2 system in Germany
    phase-1 (11.000 core) + phase-2 (> 23.000 cores)
    total peak performance > 1,2 PetaFlop/s
    peer-review access for users in BaWü und D
  - **bwUniCluster:** Tier-3 system in the state BaWü
    HPC capacity system with 8.500 cores
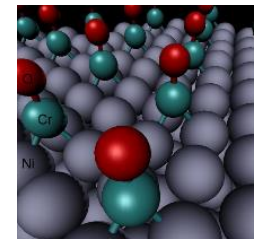   shareholder ownership with all 9 state universities

- **Joint R&D&I** with scientific communities
  - Application optimisation, scaling, model enhancements
  - Simulation Labs in HGF Programm SBD

- **HYIG** „Multiscale Biomolecular Simulation"

- **Innovation drivers** for SMEs

- **Architect** for HPC environment in BaWü

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