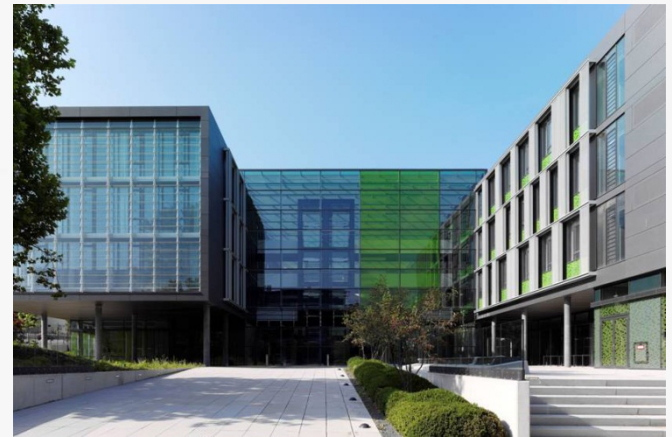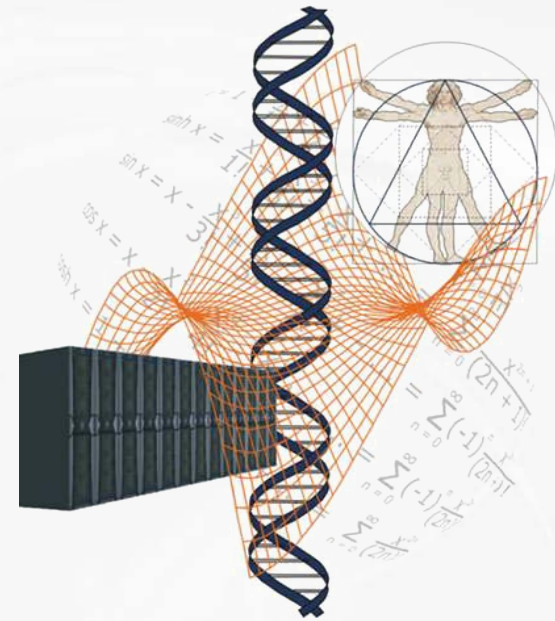# Technische Universität Dresden

- Founded in 1828

- one of the oldest **technical** universities in Germany

- 5th largest German university

- 14 faculties and a number of specialized institutes

- More than 36000 Students, about 6700 Employees, 438 professors

- International courses of studies, bachelor, masters

- One of the largest computer science faculties in Germany

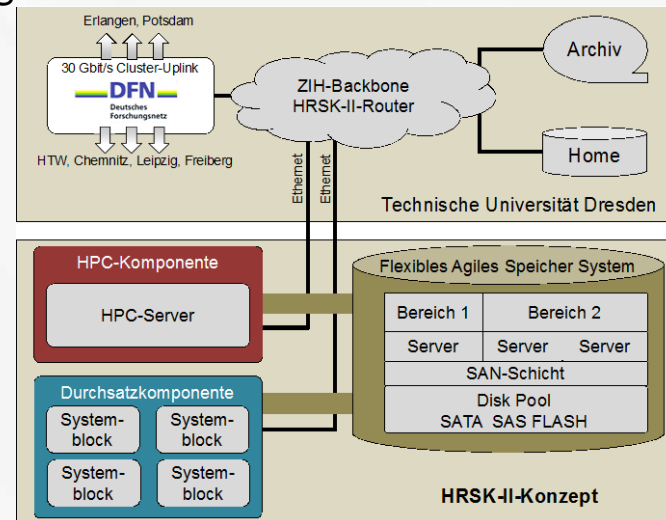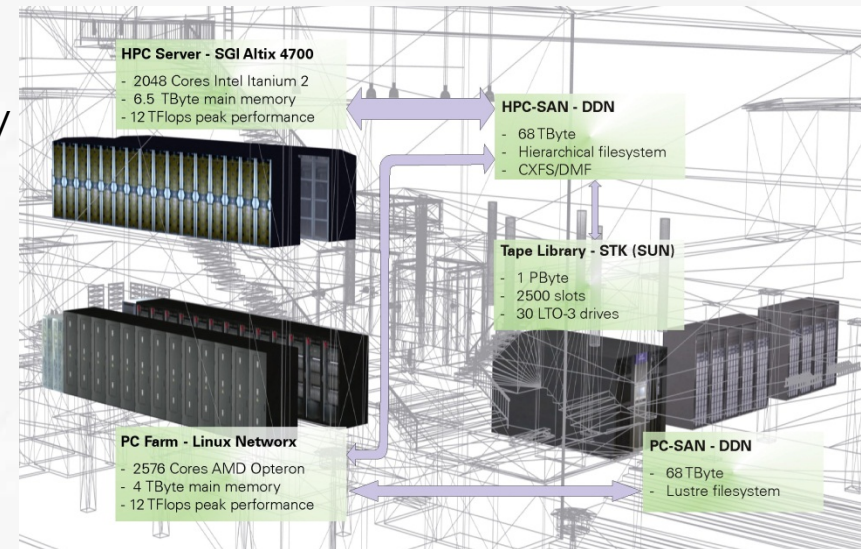- 204 million Euro annual third party funding (2010)

- http://tu-dresden.de

TECHNISCHE UNIVERSITÄT DRESDEN

ZIH

Center for Information Services & High Performance Computing

Center for Information Services and HPC (ZIH)

- Central Scientific Unit at TU Dresden

- Competence Center for „Parallel Computing and Software Tools"

- Strong commitment to support real users

- Development of algorithms and methods: Cooperation with users from all departments
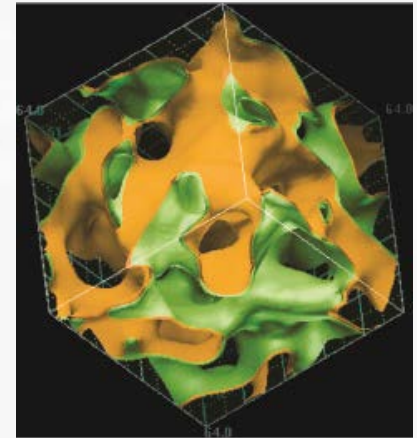
Center for Information Services and HPC (ZIH)

- Providing infrastructure and qualified service for TU Dresden and state of Saxony

  - About 10.000 cores
    - 2.000 Cores SMP machine
    - High Throughput Clusters

- Next generation HPC system

  - Application focus in Dresden: life sciences and material sciences

  - Installation 2012 / 2014

  - Budget: 15.000.000 €

- Focus on:

  - Scalability

  - Data intensive computing

  - Energy efficiency analysis

Areas of Expertise

- Research topics
  - Architecture and performance analysis of High Performance Computers
  - Programming methods and techniques for HPC systems
  - Grid Computing, Cloud Computing
  - Software tools to support programming and optimization
  - Modeling algorithms of biological processes
  - Mathematical models, algorithms, and efficient implementations
- Role of mediator between vendors, developers, and users
- Pick up and preparation of new concepts, methods, and techniques
- Teaching and Education

Structure of ZIH

- Management
  - Director: Prof. Dr. Wolfgang E. Nagel
  - Assistant directors: Dr. Peter Fischer (COO),
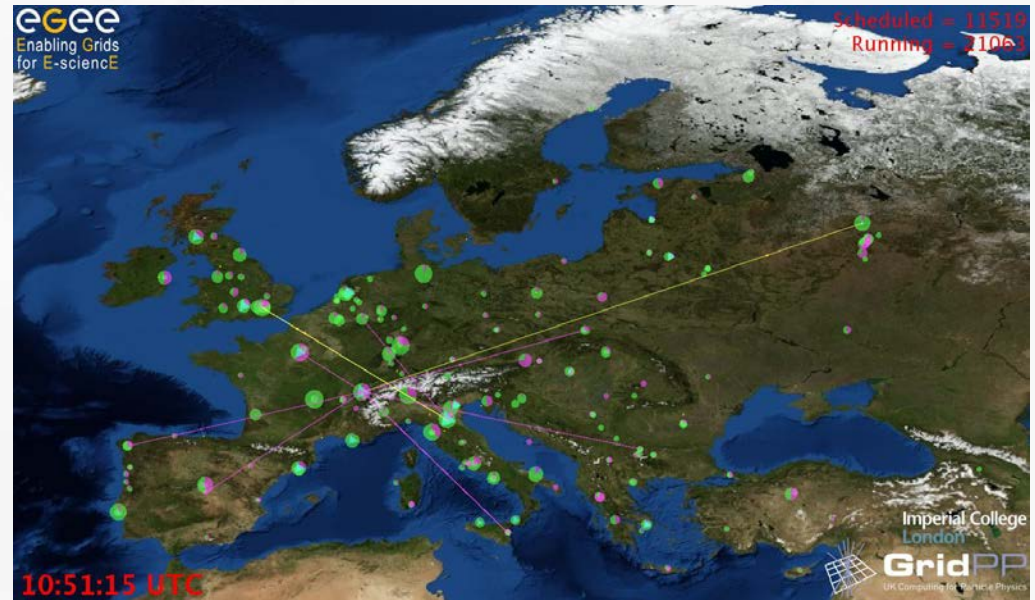   Dr. Matthias S. Müller (CTO)

- Administration (7 Employees)

- Departments (ca. 130 Employees; incl. Trainees)
  - Department of interdisciplinary function support and coordination (IAK)
  - Department of networking and communication services (NK)
  - Department of central systems and services (ZSD)
  - Department of innovative methods of computing (IMC)
  - Department of programming and software tool-kits (PSW)
  - Department of distributed and data intensive computing (VDR)
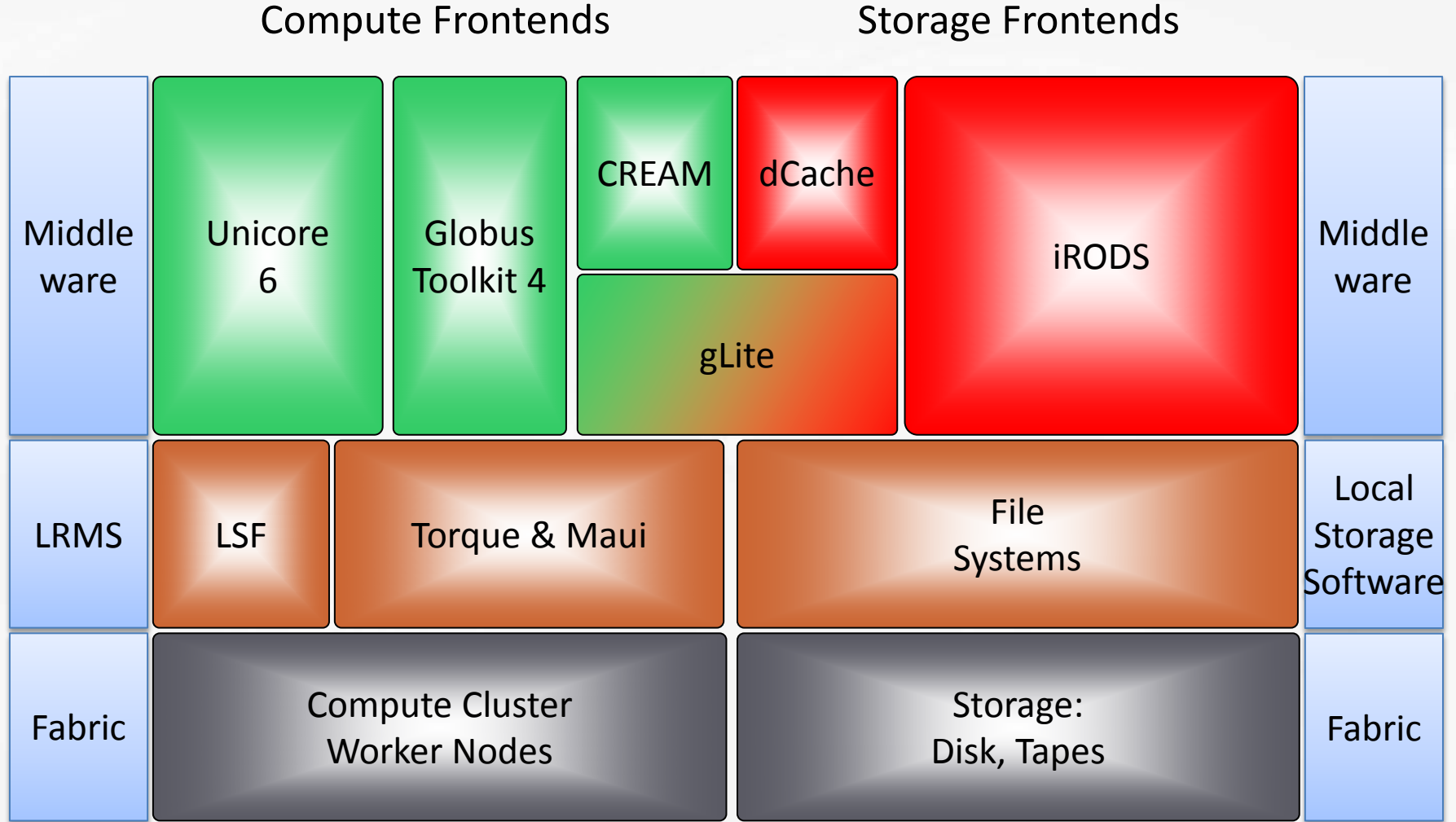
Grid Computing at ZIH – Resource Provider

D-Grid

EGI/WLCG

Grid Computing at ZIH – Resource Provider

Compute Frontends

Storage Frontends

Middleware	Unicore 6	Globus Toolkit 4	CREAM	dCache	iRODS	Middleware
			gLite			
LRMS	LSF	Torque & Maui		File Systems		Local Storage Software
Fabric	Compute Cluster Worker Nodes			Storage: Disk, Tapes		Fabric

Grid Computing – Research and Development

Data management

- D-Grid MoSGrid
  - Data-Grid for chemistry
  - UNICORE and Xtreem FS

Molecule · Recipe · Grid Workflow · Result · Data Repositories · Grid Resources

- D-Grid WisNetGrid
  - Knowledge Grid
  - Access to heterogeneous data sources
  - Metadata and ontologies

- EU-Projekt EMI
  - Data management in UNICORE
  - Interoperability (SRM, LFC)