German Priority Programme 1648
Software for Exascale Computing
Phase 2
SPPEXA – Software for Exascale

• **Strategic initiative of DFG to fund HPC software in Germany**
  - Establish collaborative, interdisciplinary co-design of HPC applications and HPC methods
  - Consists of research consortia with central, network-wide coordination

• **Aims of SPPEXA’s central coordination**
  - Central SPPEXA events, establish and foster international collaboration, doctoral retreats & coding weeks
  - Support project-specific activities, dynamically distribute network funds, education, gender incentives

• **SPPEXA research is ...**
  - ... driven by domain science / CSE application
  - ... powered by scientific computing / CSE methodology
SPPEXA’s Six Topics

• **Computational algorithms**
  • Large-scale machines
  • Efficient w.r.t. “modern” complexity measures

• **System software**
  • Process scheduling
  • System health monitoring
  • Resilience handling

• **Software tools**
  • Compiling, running, verifying, testing, optimizing

• **Application software**
  – Key driver for exascale
  – Hardware-software co-design necessary

• **Programming**
  – Make traditional approaches exascale ready
  – New programming models

• **Data Management**
  – Process large data sets
  – Archive, make data available
SPPEXA Facts

• Phase 1 consisted of 13 research consortia, while Phase 2 consists of 16.
  • Interdisciplinary research consortia
  • Involving 2-5 groups each
  • Addressing at least 2 out of the 6 SPPEXA topics

• About 60 PIs and 60 PhD students
• Overall budget of 3.7m € per year
• Two three-year funding phases
And A Really International Endeavor
Partner Institutions from:

- Japan:
  - RIKEN
  - Tokyo Tech
  - University of Tsukuba
  - University of Tokyo
  - Tohoku University
  - Tokyo University of Science
  - Toyo University

- France:
  - Université Versailles
  - Université de Strasbourg
  - Maison de la Simulation, Saclay

- other Countries:
  - TU Delft, Netherlands
  - USI Lugano, Switzerland
  - Royal Institute of Technology, Sweden
  - UCLA, USA
  - ANU, Australia
  - Hebrew University Jerusalem, Israel
A Really Interdisciplinary Endeavor

- Consortia cover > 15 disciplines
  - Requires close collaboration within and among SPPEXA consortia
  - The central coordination fosters synergistic effects within SPPEXA
- Detailed description of projects is available at
  http://www.sppexa.de