

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**

EXA-DUNE

ExaFSA

TERRA-NEO

EXASTEEL 2

GROMEX

ExaStencils

Smart-DASH

EXAHD

ExaDG

EXAMAG

FFMK

ESSEX 2

ExaSolvers

Aimes

MYX

ADA-FS

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>

