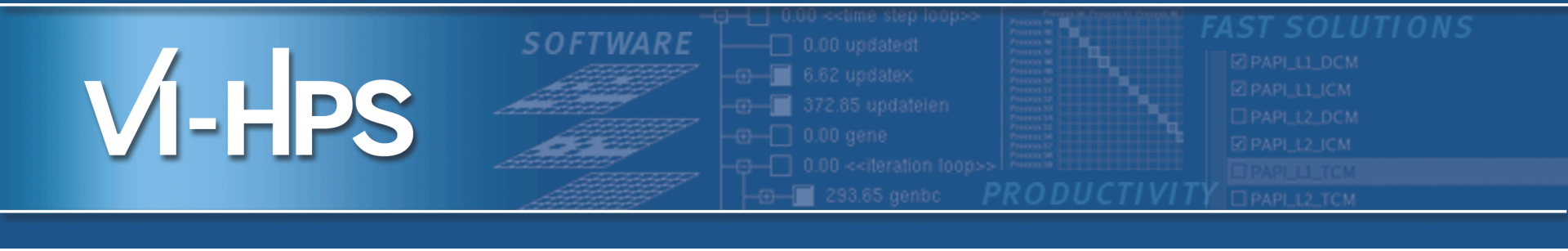



# Workshop on Extreme-Scale Performance Tools

Felix Wolf
German Research School for Simulation Sciences

November 16, 2012

VI-HPS

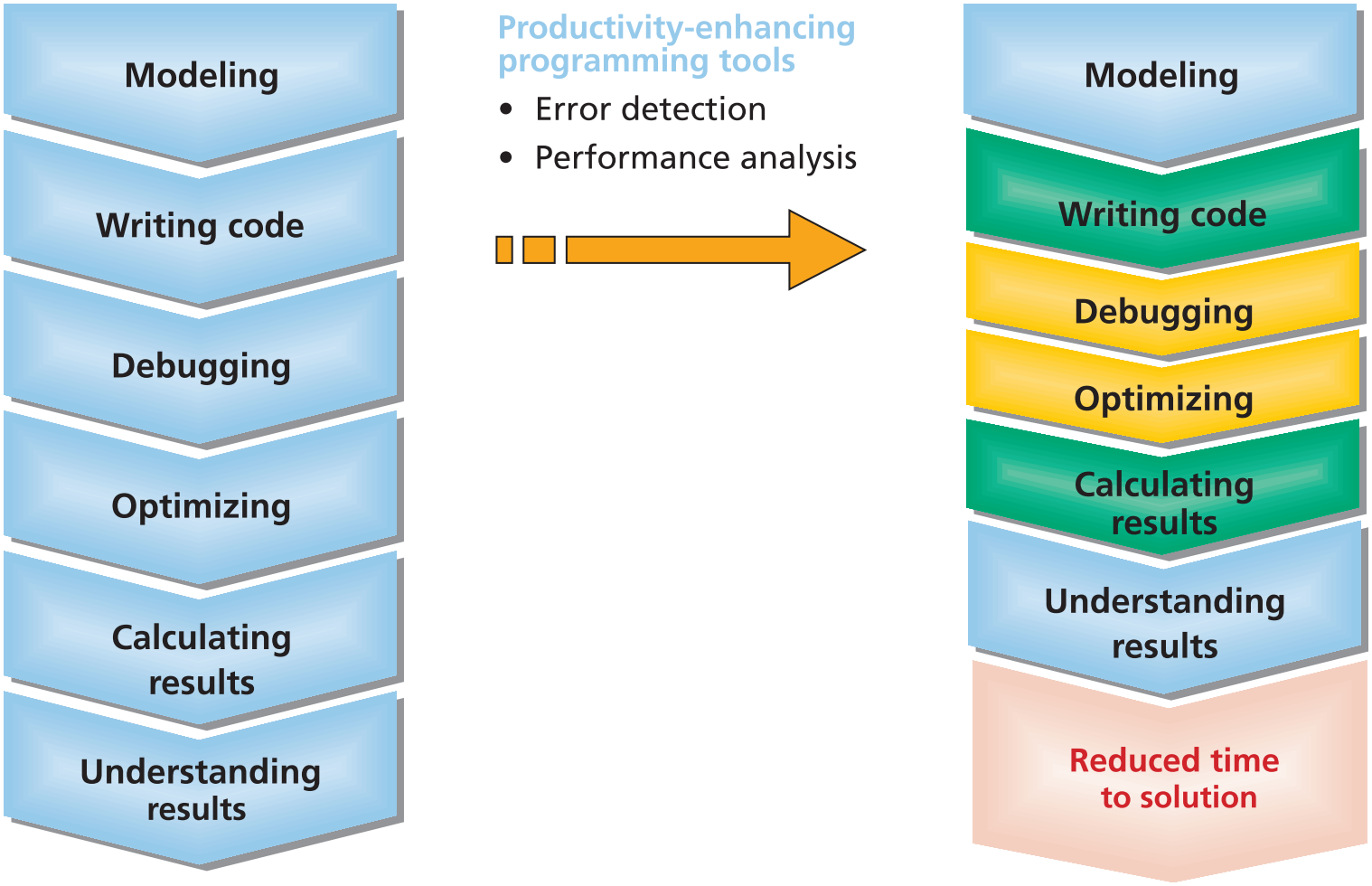
## The virtual institute in a…

HELMHOLTZ ASSOCIATION

- Partnership to develop advanced programming tools for complex simulation codes that
  - Improve code quality
  - Speed up development
- Mission elements
  - Tool development and integration
  - Training & support
  - Promotion of young scientist

www.vi-hps.org

# Productivity



# Partners & history

VI-HPS

2012 — Lawrence Livermore National Laboratory; BSC Barcelona Supercomputing Center, Centro Nacional de Supercomputación

2011 — Université de Versailles St-Quentin-en-Yvelines

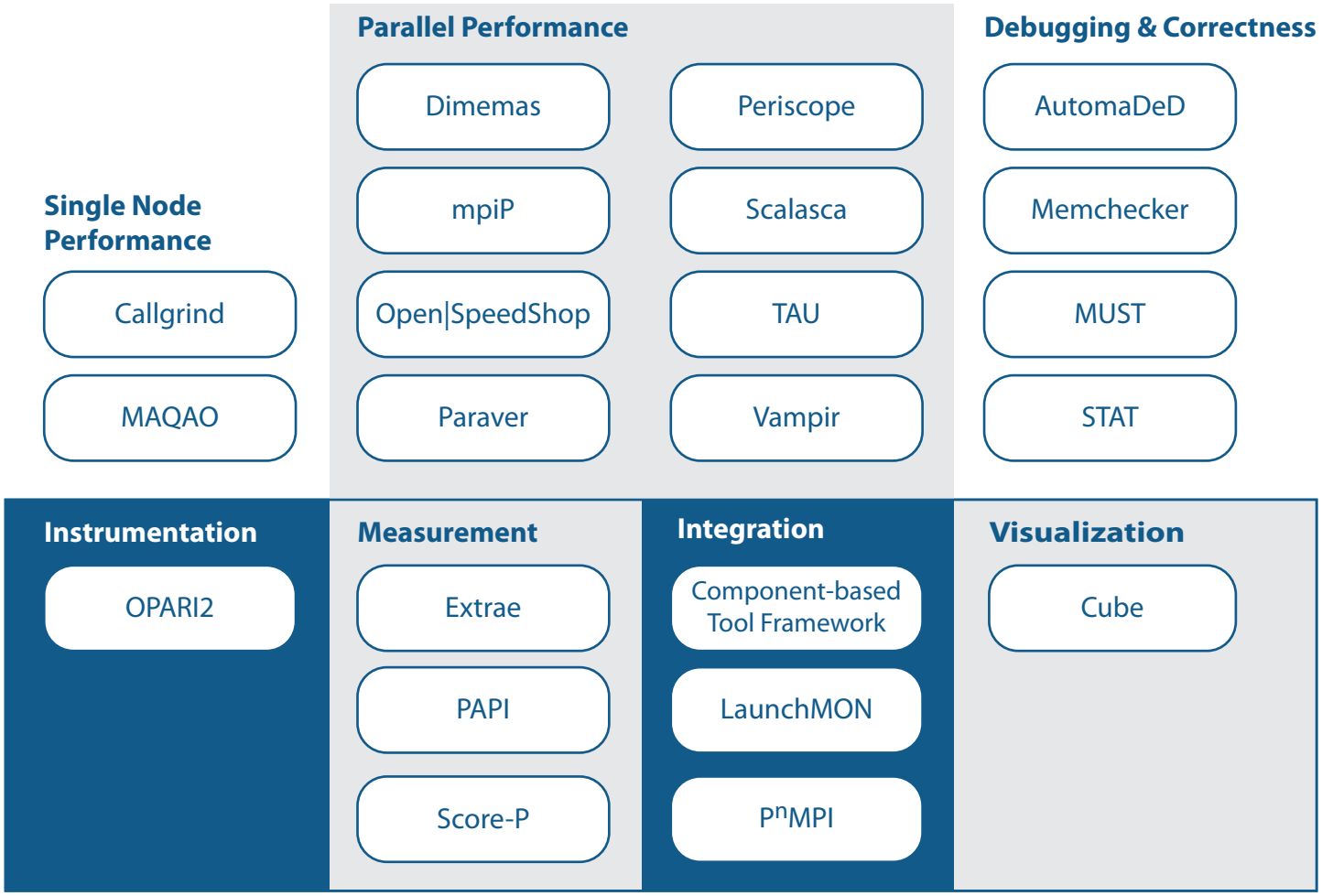
2010 — German Research School for Simulation Sciences; University of Oregon

2009 — Technische Universität München

2008 — Universität Stuttgart

2007 — Jülich Forschungszentrum; RWTH Aachen University; Technische Universität Dresden; The University of Tennessee

# Tools


Parallel Performance
Debugging & Correctness
Dimemas
Periscope
AutomaDeD
Single Node Performance
mpiP
Scalasca
Memchecker
Callgrind
Open|SpeedShop
TAU
MUST
MAQAO
Paraver
Vampir
STAT
Instrumentation
Measurement
Integration
Visualization
OPARI2
Extrae
Component-based Tool Framework
Cube
PAPI
LaunchMON
Score-P
PnMPI

# Collaboration projects

- Funded projects
  - Catwalk (DFG, 2013-2015)
  - LMAC (BMBF, 2011-2014)
  - ECS (G8, 2011-2014)
  - HOPSA (EU-FP7, 2011-2012)
  - H4H (ITEA-2, 2010-2013)
  - TEXT (2010-2012)
  - PRIMA (DOE, 2009-2013)
  - eeClust (BMBF, 2009-2012)
  - SILC (BMBF, 2009-2011)

- Software Infrastructures
  - Score-P
  - UNITE

- Conference tutorials
  - SC'07, SC'08, SC'09, SC'10, SC'11, SC'12, ICCS, Vecpar'10, Cluster'10, , EuroMPI'10, EuroMPI'12, plus various DEISA/ PRACE training schools
- Bring-your-own-code tuning workshops
  - 3-5 days tutorials + hands-on exercises
  - Aachen & Dresden (2008), Jülich & Bremen (2009), Munich & Amsterdam (2010), Stuttgart & Aachen (2011),Versailles & Munich (2012)
- Invited courses on parallel application performance analysis
  - KAUST (Saudi Arabia, 2010), CSCS (Switzerland, 2011), and NLHPC (Chile, 2012)

## PROPER scientific workshop series

- PROPER = Productivity and Performance
- Focus on tools for high-performance computing
  - Parallel program development, performance measurement, performance optimization, scalability enhancement, correctness checking, as well as case studies with user applications from science and engineering
- Held annually in conjunction with the Euro-Par conference
  - Las Palmas de Gran Canaria, Spain (2008)
  - Delft, The Netherlands (2009)
  - Ischia, Naples, Italy (2010)
  - Bordeaux, France (2011)
  - Rhodes Island, Greece (2012)
  - Aachen, Germany (2013)

Euro-Par
2013
Aachen

German Research School for Simulation Sciences

JÜLICH
FORSCHUNGSZENTRUM

RWTH AACHEN UNIVERSITY

JARA Jülich Aachen Research Alliance

# Euro-Par

## European Conference on Parallel Computing

August 26-30, 2013 | Aachen, Germany

More information **www.europar2013.org**

# Agenda

| Time | |
|---|---|
| 08:30 | Welcome and introduction to VI-HPS<br>Felix Wolf, German Research School for Simulation Sciences |
| 08:45 | **Keynote Talk**<br>Moving towards exascale via optimization for application- and hardware-aware execution<br>Laura Carrington, San Diego Supercomputing Center |
| 09:30 | Unified Performance Data Collection with Score-P<br>Bert Wesarg, Technical University of Dresden |
| 10:00 | **Coffee break** |
| 10:30 | Detecting and analyzing application structure with clustering<br>Judith Gimenez, Barcelona Supercomputing Center |
| 10:45 | Scalability Improvements in the TAU Performance System<br>Sameer Shende, University of Oregon |
| 11:00 | Scaling lessons in Scalasca<br>Brian Wylie, Jülich Supercomputing Centre |
| 11:15 | Single-node optimization: still important<br>Bettina Krammer, University of Versailles St-Quentin-en-Yvelines |
| 11:30 | Application-driven MPI profiling with $P^n$MPI and mpiP<br>Martin Schulz, Lawrence Livermore National Laboratory |
| 11:45 | Beyond Performance Analysis: Automatic Program Tuning<br>Michael Gerndt, Technical University of Munich |
| 12:00 | Combined Performance and Power Consumption Modeling and Optimization with MuMMI. Shirley Moore, University of Texas at El Paso |
| 12:15 | Discussion |