Euro-Par
2013
Aachen

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Euro-Par 2013

European Conference on Parallel Computing

August 26-30, 2013 | Aachen, Germany

PROGRAM

German Research School for Simulation Sciences
JÜLICH FORSCHUNGSZENTRUM
RWTH AACHEN UNIVERSITY
JARA Jülich Aachen Research Alliance

Program Overview

EURO-PAR 2013 | AUGUST 26-30, 2013

W/A1 Workshop Sessions
T/A Tutorial Sessions
Social Events
Regular Sessions
Keynotes & Panel

Monday, August 26, 2013 | WORKSHOPS AND TUTORIALS

	Track 1 SuperC - Ford	Track 2 SuperC - Generali	Track 3 Main Building - Lecture Hall III	Track 4 Main Building - Lecture Hall IV	Track 5 SuperC - 5.31/32	Track T Computing Center
9:00 - 10:30	HeteroPar W/A1	ROME W/A2		FedICI W/A4	PADABS W/A5	VI-HPS T/A
10:30 - 11:00	Coffee Break					
11:00 - 12:30	HeteroPar W/B1	ROME W/B2	Resilience W/B3	FedICI W/B4	PADABS W/B5	VI-HPS T/B
12:30 - 14:30	Lunch Break					
14:30 - 16:00	HeteroPar W/C1	ROME W/C2	Resilience W/C3	BigDataCloud W/C4	PADABS W/C5	VI-HPS T/C
16:00 - 16:30	Coffee Break					
16:30 - 18:00	HeteroPar W/D1	ROME W/D2	Resilience W/D3	BigDataCloud W/D4	PADABS W/D5	VI-HPS T/D

Tuesday, August 27, 2013 | WORKSHOPS AND TUTORIALS

	Track 1 SuperC - Ford	Track 2 SuperC - Generali	Tack 3 Main Building - Lecture Hall III	Track 4 Main Building – Lecture Hall IV	Track 5 SuperC - 5.31/32	Track T Computing Center
9:00 - 10:30		UCHPC W/E2	OMHI W/E3	HiBB W/E4	DIHC W/E5	OpenACC T/E
10:30 - 11:00	Coffee Break					
11:00 - 12:30	PROPER W/F1	UCHPC W/F2	OMHI W/F3	HiBB W/F4	DIHC W/F5	OpenACC T/F
12:30 - 14:30	Lunch Break					
14:30 - 16:00	PROPER W/G1	UCHPC W/G2	OMHI W/G3	MHPC W/G4	LSDVE W/G5	OpenMP T/G
16:00 - 16:30	Coffee Break					
16:30 - 18:00	PROPER W/H1			MHPC W/H4	LSDVE W/H5	OpenMP T/H
18:30	Welcome Reception					

Program Overview

EURO-PAR 2013 | AUGUST 26-30, 2013

Wednesday, August 28, 2013 | CONFERENCE

08:45 - 09:30	Conference Opening V			
09:30 - 10:30	Keynote 1 V			
10:30 - 11:00	Coffee Break			
11:00 - 12:30	Session A1 I	Session A2 II	Session A3 III	Session A4 IV
12:30 - 14:30	Lunch Break			
14:30 - 16:00	Session B1 I	Session B2 II	Session B3 III	Session B4 IV
16:00 - 16:30	Coffee Break			
17:30 - 20:30	Excursions			

Thursday, August 29, 2013 | CONFERENCE

09:00 - 10:00	Keynote 2 V			
10:00 - 10:30	Coffee Break			
10:30 - 12:30	Session C1 I	Session C2 II	Session C3 III	Session C4 IV
12:30 - 14:30	Lunch Break			
14:30 - 16:00	Session D1 I	Session D2 II	Session D3 III	
16:00 - 16:30	Coffee Break			
16:30 - 18:00	Panel V			
18:45	Conference Banquet			

Friday, August 30, 2013 | CONFERENCE

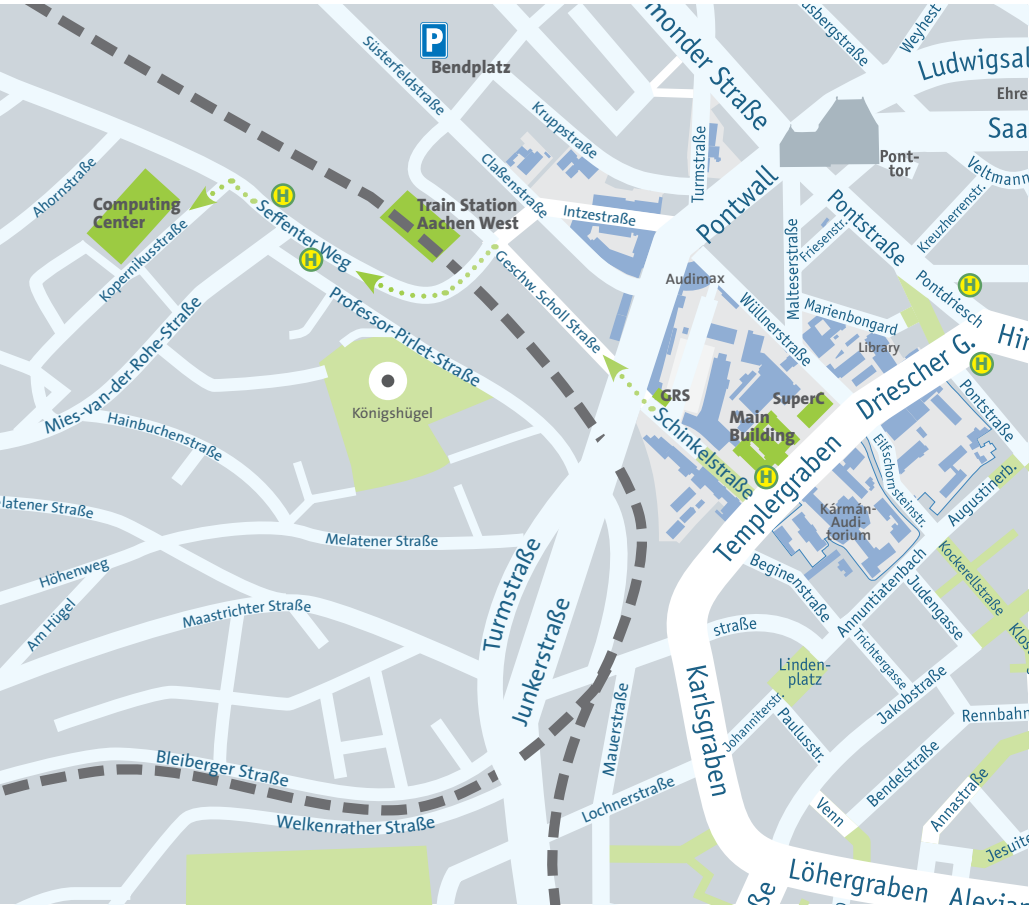
09:00 - 10:30	Session E1 I	Session E2 II	Session E3 III	Session E4 IV
10:30 - 11:00	Coffee Break			
11:00 - 12:30	Session F1 I	Session F2 II	Session F3 III	Session F4 IV
12:30 - 14:30	Lunch Break			
14:30 - 15:30	Keynote 3 V			
15:30 - 16:00	Conference Closing V			

Rooms: Regular Sessions | Keynotes & Panel | Conference Opening & Closing

I Main Building - Lecture Hall IV
II SuperC - Ford
III SuperC - Generali
IV SuperC - 5.31/32
V Main Building - Aula

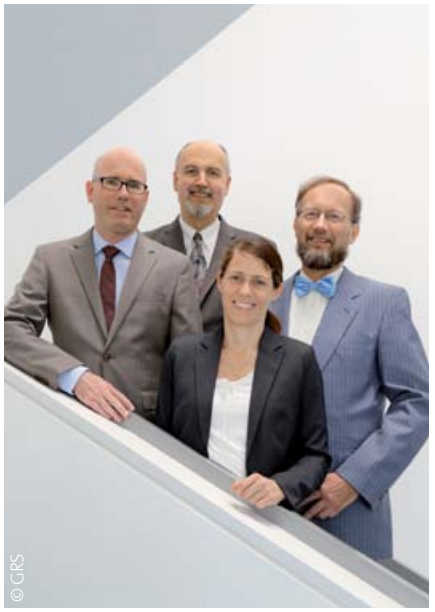
Venue

OVERVIEW RWTH MAIN CAMPUS



Preface

WELCOME TO EURO-PAR 2013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Dear friends and colleagues,

Welcome to Aachen for the 19th International European Conference on Parallel and Distributed Computing (Euro-Par 2013) and the co-located workshops and tutorials.

In this booklet you shall find the schedule of the conference, the workshops, and the tutorials as well as general information regarding conference logistics and the social events.

Euro-Par is an annual series of international conferences dedicated to the promotion and advancement of all aspects of parallel and distributed computing. Euro-Par 2013 is organized by the German Research School for Simulation Sciences, Forschungszentrum Jülich, and RWTH Aachen University in the framework of the Jülich Aachen Research Alliance (JARA).

This conference in Aachen would not have been possible without the support of many individuals and organizations. We owe special thanks to the authors of all the submitted papers, the members of the topic and workshop committees, all external reviewers, the keynote speakers, the panelists, and tutorial instructors for their contributions to the success of the conference. We would also like to express our gratitude to the members of the organizing committee and the workshop and tutorial organizers. Moreover, we are indebted to the members of the Euro-Par steering committee for their trust, guidance, and help. Finally, we would like to acknowledge the financial support that we received from our institutional and industrial sponsors.

It is a pleasure and an honor to organize and host Euro-Par 2013 in Aachen. We hope that all participants will enjoy the technical program and the social events of the conference.

We wish you a pleasant stay in Aachen

Aachen, August 2013

Felix Wolf | Bernd Mohr | Vera Kleber | Dieter an Mey

Content

EURO-PAR 2013 | AUGUST 26-30, 2013

Content

EURO-PAR 2013 | AUGUST 26-30, 2013

INFORMATION

PROGRAM | WORKSHOPS

PROGRAM | TUTORIALS

PROGRAM | KEYNOTES & PANEL

PROGRAM | REGULAR SESSIONS

SOCIAL EVENTS

Venue

MAIN BUILDING | SuperC | COMPUTING CENTER | GRS

The Euro-Par 2013 conference will take place in Aachen, Germany.

The conference is jointly organized by the German Research School for Simulation Sciences (GRS), Forschungszentrum Jülich, and RWTH Aachen University in the framework of the Jülich Aachen Research Alliance.

The Euro-Par 2013 conference and workshops will take place on the campus of RWTH Aachen University in the Main Building and the adjacent SuperC.

The tutorials will take place in the Center for Computing and Communication (Computing Center), which is a 15-minute walk from the Main Building.

Venue

MAIN BUILDING | SuperC | COMPUTING CENTER | GRS

Addresses:

MAIN BUILDING
Templergraben 55 | 52062 Aachen
http://www.rwth-aachen.de

SuperC
Templergraben 57 | 52062 Aachen

CENTER FOR COMPUTING AND COMMUNICATION (COMPUTING CENTER)
Office building | Kopernikusstraße 6 | 52074 Aachen
http://www.rz.rwth-aachen.de

GERMAN RESEARCH SCHOOL FOR SIMULATION SCIENCES (GRS)
Schinkelstr. 2a | 52062 Aachen
http://www.grs-sim.de

By foot, bus or train to Main Building, SuperC and GRS:

The conference venue is within walking distance from the city centre of Aachen and from most downtown hotels.

If you prefer public transportation, bus stops (H) near the SuperC are “Technische Hochschule” (line 13) and “Driescher Gässchen” (lines 7, 13, 33, 44, 47, 77, 147). All bus stops are a two-minute walk to Main Building, SuperC and GRS.

Please note that there is road work in the area and therefore there may be changes to bus stops.

If you arrive by train at railway station “Aachen West” you can walk to the conference venue (see the RWTH main campus map at the beginning or the fold-out city map at the end of the program).

Venue

MAIN BUILDING | SuperC | COMPUTING CENTER

Computing Center

By foot, bus or train to the Computing Center

You can reach the Computing Center after a 15-minute walk from the Main Building / SuperC. Line 3A connects the main train station (Hbf) and the stop “Mies-van-der-Rohe-Straße” every 15 minutes. Line 33 connects the city and the stop “Mies-van-der-Rohe-Straße”. To go back to the city or main train station please take line 3B (every 15 minutes).

By car to Main Building, SuperC and Computing Center

Due to major constructions in the area and limited parking places we encourage you to use public transportation. If you need to arrive by car we recommend to use a navigation system and to park at Bendplatz (see the fold-out city map at the end of the program). Once at the venue, signs will direct you to the lecture rooms of the conference.

Main Building

SuperC

Venue

CONFERENCE ROOMS

SuperC:

SuperC - Ford (6th floor)
SuperC - Generali (6th floor)
SuperC - 5.31 /32 (5th floor)

Main Building

Main Building – Aula (mezzanine floor)
Main Building – Lecture Hall III & IV (1st floor)

Computing Center

Computing Center - Seminar Room 3 (ground floor)

SuperC - Ford

General information

CONTACT | REGISTRATION & INFORMATION | NAME BADGES

Contact

In case you need help during the conference, please contact one of the organizers, recognizable by the label „Organization“ printed on their badge, or the registration desk or call +49 151 4222 0994 (Vera Kleber).

Registration and Information

The registration desk is located in the Main Building in the area just outside the Aula. To reach it, walk up the stairs to the Aula and turn right.

Registration is possible from Monday to Friday, starting at 8:00 in the morning. On Tuesday, registration will also be possible at the Welcome Reception (Altes Kurhaus). The registration desk also serves as help desk for any kind of questions and will provide information on last-minute updates of the conference schedule.

Name Badges

To facilitate the identification of registered participants, all conference attendees are asked to wear their badges visibly while being present in the conference area and during social events.

General information

WLAN AT THE EURO-PAR 2013

WLAN at the Euro-Par 2013 conference

Access to the following two WLANs (SSIDs) will be provided in all lecture rooms:

eduroam

Guests from foreign eduroam locations may use eduroam at RWTH University with their personal “foreign” access data. Make sure to connect to SSID ‘eduroam’. Connections can be encrypted using WPA2/AES or WPA/AES.

mops

All (other) participants can use the mops SSID with a guest account (username and password) which will be provided to Euro-Par participants at the registration desk.

To use the guest account:

- Connect to the WLAN “mops”.
- Enable DHCP (obtain an IP address automatically).
- Try to visit any website using a browser of your choice.
- You may want to switch to English by clicking on the UK flag.
- Follow the link to the guest login.
- Log in with your login and password and click on “login”.
- Attention: After successful authentication all data traffic is transferred without any encryption, if you use unencrypted protocols. Please use an encrypted connection only if you transfer confidential data.

If you experience any problems you can contact the service desk

In person:	On the ground floor of the SuperC between 8:00 and 18:00
Email:	servicedesk@rz.rwth-aachen. de
Phone:	+49 241 80 24 680

PLEASE FIND FURTHER INFORMATION AT

General information

CLOAKROOM AND BAGGAGE | SPEAKERS & PRESENTATIONS COFFEE BREAKS | LUNCH

Cloakroom and Baggage

You will be able to leave your coats or baggage in a cloakroom in the Main Building near the Aula. Please follow the signs.

Please note we will not accept any liability for any loss or damage to your belongings.

Speakers and Presentations

Speakers are requested to contact the session chair or technical room assistant before the start of their session. Presentation files should be copied to the presentation devices during the break before the session.

Coffee Breaks

Coffee and beverages will be offered during the coffee breaks on the 6th floor of SuperC from Monday to Friday and in the Computing Center on Monday and Tuesday.

Lunch

During registration, you will receive lunch tickets (each worth up to 20 €). These tickets can be redeemed in a number of restaurants. More information on the ticket system is summarized in chapter Social Events - Lunch.

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General information

PUBLIC TRANSPORTATION | PARKING | SHUTTLE SERVICE INFORMATION FOR PEOPLE WITH SPECIAL NEEDS

Public Transportation within Aachen

Aachen's means of public transportation is the bus. All busses are run by the local bus company ASEAG (see QR Code on the right side). Tickets have to be purchased at a vending machine or from the bus driver (payment only possible in cash). A ticket for a journey within the city center costs 1,60 € ("City-XL-Ticket").

Please note: Aachen is quite small – most places are in walking distance.

Parking

Parking is possible in all parking garages of APAG. Those parking garages are located throughout the city center. A ticket costs up to 12 € / day. A good alternative is to park at "Bendplatz" located in Kühlwetterstraße (see the fold-out city map at the end of the program) – only a 15-minute walk to the main venues. Parking at Bendplatz is available for 4 € / day.

Shuttle Service

For those who have difficulties to walk, we offer a shuttle service. Please request a shuttle at the registration desk.

Information for People with Special Needs

We are committed to ensuring that all of our guests get around the venue easily. If you have any queries or need assistance during the conference, please contact one of the organizers, who will be happy to help or call +49 151 4222 0994 (Vera Kleber).

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Organization

CONFERENCE COMMITTEE | PROGRAM COMMITTEE

CONFERENCE COMMITTEE

Conference Co-Chairs

Felix Wolf	German Research School for Simulation Sciences
Dieter an Mey	RWTH Aachen University
Bernd Mohr	Forschungszentrum Jülich

Local Organization

Vera Kleber	German Research School for Simulation Sciences
Elisabeth Altenberger	German Research School for Simulation Sciences
Michaela Bleuel	Jülich Aachen Research Alliance
Andre Dortmund	German Research School for Simulation Sciences
Beate Pütz	German Research School for Simulation Sciences
Adrian Spona	German Research School for Simulation Sciences
Andrea Wiemuth	Jülich Aachen Research Alliance

Program

Felix Wolf	German Research School for Simulation Sciences

Workshops

Dieter an Mey	RWTH Aachen University
Luc Bugé	ENS Cachan

Proceedings

Bernd Mohr	Forschungszentrum Jülich

Panel

Matthias Müller	RWTH Aachen University

PROGRAM COMMITTEE

Support Tools and Environments

Bronis R. de Supinski	Lawrence Livermore National Laboratory, USA
Bettina Krammer	Bielefeld University & University of Applied Sciences Bielefeld, Germany
Karl Fürlinger	Ludwig-Maximilians-Universität, Germany
Jesus Labarta	Barcelona Supercomputing Center, Spain
Dimitrios S. Nikolopoulos	Queen's University Belfast, UK

Performance Prediction and Evaluation

Adolfy Hoisie	Pacific Northwest National Laboratory, USA
Michael Gerndt	Technische Universität München, Germany
Shajulin Benedict	St. Xavier's Catholic College of Engineering, India
Thomas Fahringer	University of Innsbruck, Austria
Vladimir Getov	University of Westminster, UK
Scott Pakin	Los Alamos National Laboratory, USA

Scheduling and Load Balancing

Zhihui Du	Tsinghua University, China
Ramin Yahyapour	Göttingen University, Germany
Yuxiong He	Microsoft, USA
Nectarios Koziris	National Technical University of Athens, Greece
Bilha Mendelson	IBM Haifa Research Lab, Israel
Veronika Sonigo	Université de Franche-Comté, France
Achim Streit	Karlsruhe Institute of Technology, Germany
Andrei Tchernykh	Center for Scientific Research and Higher Education at Ensenada, Mexico

High-Performance Architectures and Compilers

Denis Barthou	INRIA, France
Wolfgang Karl	Karlsruhe Institute of Technology, Germany
Ramón Doallo	University of A Coruña, Spain
Evelyn Duesterwald	IBM Research, USA
Sami Yehia	Intel, USA

Parallel and Distributed Data Management

Maria S. Perez-Hernandez	Universidad Politecnica De Madrid, Spain
André Brinkmann	Johannes Gutenberg University Mainz, Germany
Stergios Anastasiadis	University of Ioannina, Greece
Sandro Fiore	Euro Mediterranean Center on Climate Change and University of Salento, Italy
Adrien Lèbre	Ecole des Mines de Nantes, France
Kostas Magoutis	Foundation for Research and Technology - Hellas, Greece

Grid, Cluster and Cloud Computing

Erwin Laure	KTH Royal Institute of Technology, Sweden
Odej Kao	Technische Universität Berlin, Germany

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PROGRAM COMMITTEE

Rosa M. Badia	Barcelona Supercomputing Center and CSIC, Spain
Laurent Lefevre	INRIA, University of Lyon, France
Beniamino Di Martino	Seconda Universita' di Napoli, Italy
Radu Prodan	University of Innsbruck, Austria
Matteo Turilli	University of Oxford, UK
Daniel Warneke	International Computer Science Institute, Berkeley, USA

Peer-to-Peer Computing

Damiano Carra	University of Verona, Italy
Thorsten Strufe	Technische Universität Darmstadt, Germany
György Dán	KTH Royal Institute of Technology, Sweden
Marcel Karnstedt	DERI, National University of Ireland Galway, Ireland

Distributed Systems and Algorithms

Achour Mostefaoui	Université de Nantes, France
Andreas Polze	Hasso-Plattner-Institute, University of Potsdam, Germany
Carlos Baquero	INESC TEC & Universidade do Minho, Portugal
Paul Ezhilchelvan	University of Newcastle, UK
Lars Lundberg	Blekinge Institute of Technology, Karlskrona, Sweden

Parallel and Distributed Programming

José Cunha	Universidade Nova de Lisboa, Portugal
Michael Philippsen	Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Domenico Talia	University of Calabria and ICAR-CNR, Italy
Ana Lucia Varbanescu	Delft University of Technology, The Netherlands

Parallel Numerical Algorithms

Julien Langou	University of Colorado Denver, USA
Matthias Bolten	University of Wuppertal, Germany
Laura Grigori	INRIA, France
Marian Vajteršic	University of Salzburg, Austria

Multicore and Manycore Programming

Luiz DeRose	Cray Inc., USA
Jan Treibig	Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
David Abramson	Monash University, Australia
Alastair Donaldson	Imperial College London, UK

Organization
PROGRAM COMMITTEE

INFORMATION

William Jalby	University of Versailles Saint-Quentin-en-Yvelines, France
Alba Cristina M. A. de Melo	University of Brasilia, Brazil
Tomàs Margalef	Universitat Autònoma de Barcelona, Spain

Theory and Algorithms for Parallel Computation

Giuseppe F. Italiano	Università di Roma 2 Tor Vergata, Italy
Henning Meyerhenke	Karlsruhe Institute of Technology (KIT), Germany
Guy Blelloch	Carnegie Mellon University, USA
Philippas Tsigas	Chalmers University of Technology, Sweden

High-Performance Networks and Communication

Olav Lysne	Simula Research Laboratory, Norway
Torsten Hoefler	Swiss Federal Institute of Technology Zurich, Switzerland
Pedro López	Universitat Politècnica de València, Spain
Davide Bertozzi	University of Ferrara, Italy

High-Performance and Scientific Applications

Turlough P. Downes	Dublin City University, Ireland
Sabine Roller	University of Siegen, Germany
Ari P. Seitsonen	University of Zurich, Switzerland
Sophie Valcke	CERFACS, France

GPU and Accelerator Computing

Naoya Maruyama	RIKEN Advanced Institute for Computational Science, Japan
Leif Kobbelt	RWTH Aachen University, Germany
Pavan Balaji	Argonne National Laboratory, USA
Nikola Puzovic	Barcelona Supercomputing Center, Spain
Samuel Thibault	University of Bordeaux, France
Kun Zhou	Zhejiang University, China

Extreme-Scale Computing

David Keyes	King Abdullah University of Science and Technology, Saudi Arabia
Marie-Christine Sawley	Intel Exascale Lab Paris, France
Thomas Schulthess	ETH Zurich, Switzerland
John Shalf	Lawrence Berkeley National Laboratory, USA

Program | Workshops
OVERVIEW

W/A1 Workshop Sessions

Breaks

Monday, August 26, 2013 | WORKSHOPS

	Track 1 SuperC - Ford	Track 2 SuperC - Generali	Tack 3 Main Building - Lecture Hall III	Track 4 Main Building - Lecture Hall IV	Track 5 SuperC - 5.31/32
9:00 - 10:30	HeteroPar W/A1	ROME W/A2		FedICI W/A4	PADABS W/A5
10:30 - 11:00	Coffee Break				
11:00 - 12:30	HeteroPar W/B1	ROME W/B2	Resilience W/B3	FedICI W/B4	PADABS W/B5
12:30 - 14:30	Lunch Break				
14:30 - 16:00	HeteroPar W/C1	ROME W/C2	Resilience W/C3	BigDataCloud W/C4	PADABS W/C5
16:00 - 16:30	Coffee Break				
16:30 - 18:00	HeteroPar W/D1	ROME W/D2	Resilience W/D3	BigDataCloud W/D4	PADABS W/D5

Tuesday, August 27, 2013 | WORKSHOPS

	Track 1 SuperC - Ford	Track 2 SuperC - Generali	Tack 3 Main Building - Lecture Hall III	Track 4 Main Building - Lecture Hall IV	Track 5 SuperC - 5.31/32
9:00 - 10:30		UCHPC W/E2	OMHI W/E3	HiBB W/E4	DIHC W/E5
10:30 - 11:00	Coffee Break				
11:00 - 12:30	PROPER W/F1	UCHPC W/F2	OMHI W/F3	HiBB W/F4	DIHC W/F5
12:30 - 14:30	Lunch Break				
14:30 - 16:00	PROPER W/G1	UCHPC W/G2	OMHI W/G3	MHPC W/G4	LSDVE W/G5
16:00 - 16:30	Coffee Break				
16:30 - 18:00	PROPER W/H1			MHPC W/H4	LSDVE W/H5

Program | Workshops
OVERVIEW

BigDataCloud Page 28
Big Data Management in Clouds
Mon 14:30 – 18:00, Main Building - Lecture Hall IV

DIHC Page 36
Dependability and Interoperability in Heterogeneous Clouds
Tue 9:00 – 12:30, SuperC - 5.31/32

FedICI Page 27
Federative and Interoperable Cloud Infrastructures
Mon 9:15 – 12:30, Main Building - Lecture Hall IV

HeteroPar Page 22-23
Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms
Mon 9:00 – 18:00, SuperC - Ford

HiBB Page 34
High Performance Bioinformatics and Biomedicine
Tue 9:00 – 12:30, Main Building - Lecture Hall VI

LSDVE Page 37
Large Scale Distributed Virtual Environments on Clouds and P2P
Tue 14:30 – 18:00, SuperC - 5.31/32

MHPC Page 35
Middleware for HPC and Big Data Systems
Tue 14:30 – 18:00, Main Building - Lecture Hall IV

OMHI Page 33
On-chip Memory Hierarchies and Interconnects
Tue 9:00 – 16:10, Building - Lecture Hall III

PADABS Page 29-30
Parallel and Distributed Agent Based Simulations
Mon 9:00 – 18:00, SuperC - 5.31/32

PROPER Page 31
Productivity and Performance
Tue 11:00 – 18:00, SuperC - Ford

Resilience Page 26
Resiliency in High Performance Computing with Clusters, Clouds, and Grids
Mon 11:15 – 18:00, Main Building - Lecture Hall III

ROME Page 24-25
Runtime and Operating Systems for the Many-core Era
Mon 9:00 – 18:00, SuperC - Generali

UCHPC Page 32
UnConventional High Performance Computing
Tue 9:00 – 16:00, SuperC - Generali


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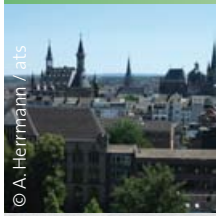
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HeteroPar 2013 – 11th Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms

MONDAY, AUGUST 26, 2013 | 9:00 - 18:00 | SuperC - FORD

Paolo Bientinesi (Chair), RWTH Aachen, Germany
Enrique Quintana-Ortí (Co-Chair), Universidad Jaume I, Spain

Session W/A1 | Chair: Paolo Bientinesi

9:00 **Data-Management Directory for OpenMP 4.0 and OpenACC**
Julien Jaeger, Patrick Carribault, Marc Pérache

9:30 **A Source-to-Source OpenACC compiler for CUDA**
Akihiro Tabuchi, Masahiro Nakao, Mitsuhisa Sato

10:00 **Compiler-Driven Data Layout Transformation for Heterogeneous Platforms**
Deepak Majeti, Rajkishore Barik, Jisheng Zhao, Vivek Sarkar, Max Grossman

Session W/B1 | Chair: Paolo Bientinesi

11:00 **An approach for solving the Helmholtz Equation on heterogeneous platforms**
Gloria Ortega, Inmaculada García, G. Ester Martín Garzón

11:30 **Computation of Mutual Information Metric for Image Registration on Multiple GPUs**
Andrew Adinetz, Markus Axer, Marcel Huysegoms, Stefan Köhnen, Jiri Kraus, Dirk Pleiter

12:00 **Optimization of a Cloud Resource Management Problem from a Consumer Perspective**
Rafaelli Coutinho, Lúcia Drummond, Yuri Frota

Program | Workshops
WORKSHOP DETAILS | MONDAY | TRACK 1

WORKSHOPS

Session W/C1 | Chair: Paolo Bientinesi

14:30 **Scheduling Independent Tasks on Multi-Cores with GPU Accelerators**
Safia Kedad-Sidhoum, Florence Monna, Gregory Mounie, Denis Trystram

15:00 **Towards an unified heterogeneous development model in Android**
Alejandro Acosta, Francisco Almeida

15:30 **An Automated Approach for Estimating the Memory Footprint of Non-Linear Data Objects**
Sebastian Dreßler, Thomas Steinke

Session W/D1 | Chair: Paolo Bientinesi

16:30 **Communication Models for Resource Constrained Hierarchical Ethernet Networks**
Jun Zhu, Alexey Lastovetsky, Shoukat Ali, Rolf Riesen

17:00 **Non-clairvoyant reduction algorithms for heterogeneous platforms**
Anne Benoit, Louis-Claude Canon, Loris Marchal

17:30 **Managing Heterogeneous Processor Machine Dependencies in Computer Networking Applications**
Ralph Duncan, Peder Jungck, Kenneth Ross, Jim Frandeen, Greg Triplett

18:00 **Best paper award**

ROME 2013 – 1st Workshop on Runtime, Operating Systems for the Many-core Era

MONDAY, AUGUST 26, 2013 | 9:00 - 18:00 | SuperC - GENERALI

Carsten Clauss (Chair), RWTH Aachen University
Stefan Lankes (Co-Chair), RWTH Aachen University

Session W/A2 | Chair: Stefan Lankes

9:00 Welcome speech and announcements

9:15 Predicting the Future in a Rapidly Changing Many-core World
Invited Speaker: Tim Mattson, Intel Corporation, USA

10:00 Evaluation Methodology for Data Communication-aware Application Partitioning
Imran Ashraf, S. Arash Ostadzadeh, Roel Meeuws, Koen Bertels

Session W/B2 | Chair: Michael Riepen
Scheduling and Load Balancing

11:00 Elastic Manycores – How to bring the OS back into the scheduling game?
Marcus Völp, Michael Roitzsch

11:30 DYON: Managing a New Scheduling Class to Improve System Performance in Multicore Systems
Ramon Nou, Jacobo Giralt, Toni Cortes

12:00 Energy-efficient and Fault-Tolerant Taskgraph Scheduling for Manycores and Grids
Patrick Eitschberger, Jörg Keller

Program | Workshops
WORKSHOP DETAILS | MONDAY | TRACK 2

WORKSHOPS

Session W/C2 | Chair: Carsten Trinitis
Predictable and Reliable Runtimes

14:30 Designing Applictions with Predictable Runtime Characteristics for the Baremetal Intel SCC
Devendra Rai, Lars Schor, Nikolay Stoimenov, Iuliana Bacivarov, Lothar Thiele

15:00 Reliable and Efficient Execution of Multiple Streaming Applications on Intel's SCC Processor
Lars Schor, Devendra Rai, Hoeseok Yang, Iuliana Bacivarov, Lothar Thiele

15:30 A formally verified static hypervisor with hardware support for a many-core chip
Geoffrey Plouviez, Emmanuelle Encrenaz, Franck Wajsbürt

Session W/D2 | Chair: Carsten Clauss
Scalable Runtimes and Kernel Extensions

16:30 Toward a Self-Aware System for Exascale Architectures
Aaron Landwehr, Stephane Zuckerman, Guang Gao

17:00 A Scalability-Aware Kernel Executive for Many-Core Operating Systems
Gabor Drescher, Timo Hönig, Sebastian Maier, Benjamin Oechslein, Wolfgang Schröder-Preikschat

17:30 Towards Predictability of Operating System supported Communication for PCIe based Clusters
Pablo Reble, Georg Wassen

Resilience 2013 – 6th Workshop on Resiliency in High Performance Computing with Clusters, Clouds, and Grids

MONDAY, AUGUST 26, 2013 | 11:15 - 18:00 | MAIN BUILDING - LECTURE HALL III

Stephen L. Scott (Chair), Tennessee Tech University and Oak Ridge National Laboratory, USA
Chokchai (Box) Leangsuksun (Co-Chair), Louisiana Tech University, USA
Patrick G. Bridges (Co-Chair), University of New Mexico, USA
Christian Engelmann (Co-Chair), Oak Ridge National Laboratory , USA

Session W/B3 | Chair: Christian Engelmann

11:15 **Introduction**
Stephen L. Scott

11:30 **Evaluate the Viability of Application-Driven Cooperative CPU/GPU Fault Detection**
Dong Li, Seyong Lee, Jeffrey Vetter

12:00 **GPU Behavior on a Large HPC Cluster**
Nathan Debardeleben, Sean Blanchard, Laura Monroe, Phil Romero, Daryl Grunau, Craig Idler, Cornell Wright

Session W/C3 | Chair: Stephen L. Scott

14:30 **A Case for Adaptive Redundancy for HPC Resilience**
Saurabh Hukerikar, Pedro C. Diniz, Robert F. Lucas

15:00 **Reliable Service Allocation in Clouds with Memory and Capacity Constraints**
Olivier Beaumont, Lionel Eyraud-Dubois, Pierre Pesneau, Paul Renaud-Goud

15:30 **Model-Driven Resilience Assessment of Modifications to HPC Infrastructures**
Christian Straube, Dieter Kranzlmüller

Session W/D3 | Chair: Christian Engelmann

16:30 **Asking the right questions: benchmarking fault-tolerant extreme-scale systems**
Patrick Widener, Kurt Ferreira, Scott Levy, Patrick Bridges, Dorian Arnold, Ron Brightwell

17:00 **Using Performance Tools to Support Experiments in HPC Resilience**
Thomas Naughton, Swen Boehm, Christian Engelmann, Geoffroy Vallee

17:30 **Discussion & Closing**
Stephen L. Scott

FedICI 2013 – 1st International Workshop on Federative and Interoperable Cloud Infrastructures

MONDAY, AUGUST 26, 2013 | 9:15 - 12:30 | MAIN BUILDING - LECTURE HALL IV

Gabor Kecskemeti (Chair), University of Innsbruck, Austria
Attila Kertesz (Co-Chair) , MTA SZTAKI and University of Szeged, Hungary
Attila Csaba Marosi (Co-Chair), MTA SZTAKI, Hungary
Radu Prodan (Co-Chair), University of Innsbruck, Austria

Session W/A4 | Chair: Attila Kertesz

9:15 **Welcome Note**
Attila Kertesz

9:30 **Adaptive Live Migration to Improve Load Balancing in Data Centers**
Peng Lu, Antonio Barbalace, Roberto Palmieri, Binoy Ravindran

10:00 **Cloud and Network facilities federation in BonFIRE**
David García Pérez, Juan Ángel Lorenzo Del Castillo, Yahya Al-Hazmi, Josep Martrat, Konstantinos Kavoussanakis, Alastair C. Hume, Celia Velayos López, Giada Landi, Tim Wauters, Michael Gienger, David Margery

Session W/B4 | Chair: Attila Kertesz

11:00 **Execution of scientific workflows on federated multi-cloud infrastructures**
Daniele Lezzi, Francesc-Josep Lordan Gomis, Roger Rafanell, Rosa M. Badia

11:30 **Expressing Quality of Service and Protection Using Federation-Level Service Level Agreement**
Wolfgang Ziegler, Jens Jensen, Lorenzo Blasi

12:00 **Towards a Swiss National Research Infrastructure**
Peter Kunszt, Sergio Maffioletti, Dean Flanders, Markus Eurich, Thomas Bohnert, Andrew Edmonds, Heinz Stockinger, Sigve Haug, Almerina Jamakovic-Kapic, Placi Flury, Simon Leinen, Eryk Schiller

BigDataCloud 2013 – 2nd Workshop on Big Data Management in Clouds

MONDAY, AUGUST 26, 2013 | 14:30 - 18:00 | MAIN BUILDING - LECTURE HALL IV

Alexandru Costan (Chair), Inria Rennes - Bretagne Atlantique, France
Frédéric Desprez (Co-Chair), Inria / ENS Lyon, France

Session W/C4 | Chair: Frédéric Desprez

14:30 Understanding Vertical Scalability of I/O Virtualization for MapReduce Workloads: Challenges and Opportunities
Bogdan Nicolae

15:30 Cloud Data Storage Federation for Scientific Applications
Spiros Koulouzis, Dmitry Vasyunin, Reginald Cushing, Adam, Marian Bubak

16:00 In-Vivo Storage System Development
Noah Watkins, Carlos Maltzahn, Scott Brandt, Ian Pye, Adam Manzanares

Session W/D4 | Chair: Alexandru Costan

16:30 Advancing Science with Big Data in the Cloud
Invited speaker: Dr. Götz Brasche, Microsoft Research,
Advanced Technology Labs Europe

17:10 Towards Workload-Driven Automated Adaptation of Data Organization in Heterogeneous Storage Systems
Nikolaus Jeremic, Helge Parzyjegla, Gero Mühl, Jan Richling

17:40 MapReduce in GPI-Space
Tiberiu Rotaru, Mirko Rahn

PADABS 2013 – 1st Workshop on Parallel and Distributed Agent Based Simulations

MONDAY, AUGUST 26, 2013 | 9:00 - 18:00 | SuperC - 5.31/32

Vittorio Scarano (Chair), Università di Salerno, Italy
Gennaro Cordasco (Co-Chair), Seconda Università di Napoli, Italy
Rosario De Chiara (Co-Chair), Poste Italiane, Italy
Ugo Erra (Co-Chair), Università della Basilicata, Italy

Session W/A5 | Chair: Vittorio Scarano
Welcome to PADABS and Tutorials

9:00 Welcome
Vittorio Scarano, Rosario De Chiara, Gennaro Cordasco

9:05 Distributed Mason (Tutorial)
Vittorio Scaran

9:30 ROOT-Sim (Tutorial)
Alessandro Pellegrini

10:00 FLAME GPU (Tutorial)
Daniela Romano

Session W/B5 | Chair: Vittorio Scarano
Parallel Agent-Based Simulations

11:00 Parallel Hierarchical A* for Multi Agent-based Simulation on the GPU
Ugo Erra, Giuseppe Caggianese

11:30 Agent Migration in HPC Systems using FLAME
Claudio Márquez, Eduardo César, Joan Sorribes

12:00 Communication Strategies in Distributed Agent-Based Simulations: the Experience with D-MASON
Gennaro Cordasco, Carmine Spagnuolo, Francesco Milone, Ada Mancuso

PADABS 2013 – continued

Session W/C5 | Chair: Gennaro Cordasco
Parallel and Distributed Agent-Based Simulations

14:30 **MCSMA: a toolkit to benefit from many-core architectures in agent based simulation**
Guillaume Laville, Kamel Mazouzi, Christophe Lang, Nicolas Marilleau, Bénédicte Herrmann, Laurent Philipppe

15:00 **Supporting the exploratory nature of simulations in D-Mason**
Gennaro Cordasco, Rosario De Chiara, Fabio Fulgido, Mario Fiore Vitale

15:30 **Parallel ABM for electricity distribution grids: a case study**
Fanny Boulaire, Mark Utting, Robin Drogemuller

Session W/D5 | Chair: Rosario De Chiara | Use Cases

16:30 **A distributed simulation of roost-based selection for altruistic behavior in vampire bats**
Mario Paolucci, Luca Vicidomini

17:00 **A Study on the Parallelization of Terrain-Covering Ant Robots Simulations**
Alessandro Pellegrini, Francesco Quaglia

17:30 **Sociality, sanctions, damaging behaviors: a distributed implementation of an agent-based simulation model**
Michele Carillo, Nicola Lettieri, Domenico Parisi, Francesco Raia, Flavio Serrapica, Luca Vicidomini

PROPER 2013 – 6th Workshop on Productivity and Performance

TUESDAY, AUGUST 27, 2013 | 11:00 - 18:00 | SuperC - FORD

Martin Schulz (Chair), Lawrence Livermore National Laboratory, USA

Session W/F1 | Chair: Martin Schulz | Welcome and Keynote

11:00 **Welcome to PROPER 2013**
Martin Schulz

11:15 **Performance Productivity Challenges and Researches for the Future of Computing**
Invited speaker: Victor Lee, Intel Corporation, USA

Session W/G1 | Chair: David Boehme | Runtime Measurements and Analysis

14:30 **Data Transfer Requirement Analysis with Bandwidth Curves**
Josef Weidendorfer

15:00 **Tracking a Value's Influence on Later Computation**
Philip Roth

15:30 **Assessing measurement and analysis performance and scalability of Scalasca**
Ilya Zhukov, Brian Wylie

Session W/H1 | Chair: Brian Wylie | Program Analysis and Algorithms

16:30 **Detecting SIMDization Opportunities through Static/Dynamic Dependence Analysis**
Olivier Aumage, Denis Barthou, Christopher Haine, Tamara Meunier

17:00 **A High-Level IR Transformation System**
Herbert Jordan, Peter Thoman, Thomas Fahringer

17:30 **Implementing a systolic algorithm for QR factorization on multicore clusters with PaRSEC**
Guillaume Aupy, Mathieu Faverge, Yves Robert, Jakub Kurzak, Piotr Luszczek, Jack Dongarra

UCHPC 2013 – 6th Workshop on UnConventional High Performance Computing

TUESDAY, AUGUST 27, 2013 | 9:00 - 16:00 | SuperC - GENERALI

Josef Weidendorfer (Chair), Technische Universität München, Germany
Jens Breitbart (Co-Chair), Heidelberg University, Germany
Anders Hast (Co-Chair), Uppsala University, Sweden

Session W/E2 | Chair: Josef Weidendorfer

9:00 Opening

9:15 Embedded Processors for HPC: The Mont-Blanc Project
Invited speaker: Daniele Tafani, Leibniz Supercomputing Centre, Germany

10:00 PyDac: A Resilient Run-time Framework for Divide-and-Conquer Applications on a Heterogeneous Many-core Architecture
Bin Huang, Ron Sass, Nathan Debardeleben, Sean Blanchard

Session W/F2 | Chair: Jens Breitbart

11:00 Investigating the Integration of Supercomputers and Data-Warehouse Appliances
Ron A. Oldfield, George Davidson, Craig Ulmer, Andrew Wilson

11:30 Investigation of Parallel Programmability and Performance of a Calxeda ARM Server Using OpenCL
David Richie, James Ross, Jordan Ruloff, Song Park, Lori Pollock, Dale Shires

12:00 Active data structures on GPGPUs
John T. O'Donnell, Cordelia Hall, Stuart Monro

Session W/G2 | Chair: Peter Zinterhof

14:30 Architecture of a High-speed MPI_Bcast Leveraging Software-Defined Network
Khureltulga Dashdavaa, Susumu Date, Hiroaki Yamanaka, Eiji Kawai, Yasuhiro Watashiba, Kohei Ichikawa, Hirotake Abe, Shinji Shimojo

15:00 HPC Acceleration with Data Flow Programming
Invited speaker: Oliver Pell, Maxeler Technologies, UK

15:45 Best Paper Award Ceremony and Workshop Closing

OMHI 2013 – 2nd International Workshop on On-chip Memory Hierarchies and Interconnects

TUESDAY, AUGUST 27, 2013 | 9:00 - 16:10 | MAIN BUILDING - LECTURE HALL III

Julio Sahuquillo (Chair), Universitat Politècnica de València, Spain
Maria Engracia Gómez (Co-Chair), Universitat Politècnica de València, Spain
Salvador Petit (Co-Chair), Universitat Politècnica de València, Spain

Session W/E3 | Chair: Julio Sahuquillo

9:00 Welcome and Opening Remarks

9:15 Data Movement Options for Accelerated Clusters
Invited Speaker: Holger Fröning, University of Heidelberg, Germany

Session W/F3 | Chair: Julio Sahuquillo

11:00 Impact of the Memory Controller on the Performance of Parallel Workloads
Crispín Gómez

11:30 Exploiting Parallelization on Address Translation: Shared Page Walk Cache
Albert Esteve, Maria Engracia Gómez, Antonio Robles

12:00 A Novel Memory Subsystem and Computational Model for Parallel Reconfigurable Architectures
Yamuna Rajasekhar, Ron Sass

Session W/G3 | Chair: Crispín Gómez

14:30 Enhancing Performance and Energy Consumption of HER Caches by Adding Associativity
Vicent Lorente, Alejandro Valero, Ramon Canal

15:00 Power Saving by NoC Traffic Compression
María Soler Heredia, Jose Flich

15:30 A Lightweight Network of IDs to Quickly Deliver Simple Control Messages
Mario Lodde, Jose Flich

16:00 Best Paper Award

HiBB 2013 – 4th Workshop on High Performance Bioinformatics and Biomedicine

TUESDAY, AUGUST 27, 2013 | 9:00 - 12:30 | MAIN BUILDING - LECTURE HALL IV

Mario Cannataro (Chair), University Magna Graecia of Catanzaro, Italy

Session W/E4 | Chair: Mario Cannataro
Large Scale High Performance Biomedicine

9:00 Epidemic Data Mining: Global Knowledge without Global Communication
Invited speaker: Giuseppe Di Fatta, University of Reading, UK

10:00 Heterogeneous Platforms Programming for Faster Medical Imaging Processing
Renan Sales Barros, Sytse van Geldermalsen, A. M. Boers,
Adam S. Z. Belloum, Henk A. Marquering, Silvia D. Olabarriaga

Session W/F4 | Chair: Mario Cannataro
Software Platforms for Bioinformatics and Systems

11:00 Transparent Incremental Updates for Genomics Data Analysis Pipelines
Edvard Pedersen, Nils P. Willassen, Lars Ailo Bongo

11:30 msPar: A Parallel Coalescent Simulator
Carlos Montemuiño, Antonio Espinosa, Juan Carlos Moure,
Gonzalo Vera Rodríguez, Sebastián Ramos-Onsins, Porfidio Hernández Budé

12:00 Panel on High Performance Bioinformatics and Biomedicine
Chair: Mario Cannataro
Panelists: Renan Sales Barros, Giuseppe Di Fatta, Antonio Espinosa,
Edvard Pedersen

Program | Workshops
WORKSHOP DETAILS | TUESDAY | TRACK 4

WORKSHOPS

MHPC - Middleware for HPC and Big Data Systems

TUESDAY, AUGUST 27, 2013 | 14:30 - 18:00 | MAIN BUILDING - LECTURE HALL IV

Michael Alexander (Chair), TU Wien, Austria
Anastassios Nanos (Co-Chair), NTUA, Greece
Jie Tao (Co-Chair), Karlsruhe Institut of Technology, Germany
Lizhe Wang (Co-Chair), Chinese Academy of Sciences, China
Gianluigi Zanetti (Co-Chair), CRS4, Italy

Session W/G4 | Chair: Michael Alexander

14:30 Dynamic Hadoop clusters on HPC scheduling systems
Invited Speaker: Gianluigi Zanetti, CRS4, Italy

15:00 Efficient Random Network Coding for Distributed Storage Systems
Adam Visegrad, Péter Kacsuk

15:30 Hybrid Job Scheduling for Improved Cluster Utilization
Ismail Ari, Ugur Kocak

Session W/H4 | Chair: Anastassios Nanos

16:30 Portfolio Hypervisor Scheduling
Michael Alexander

17:00 The Case for Multi-engine Data Analytics
Dimitrios Tsoumakos, Christos Mantas

17:30 Panel: Towards Heterogenous Resource Scheduling Middleware

DIHC 2013 – 1st Workshop on Dependability and Interoperability in Heterogeneous Clouds

TUESDAY, AUGUST 27, 2013 | 9:00 - 12:30 | SuperC-5.31/32

Christine Morin (Chair), INRIA, France
Roberto Cascella (Co-Chair), INRIA, France
Thilo Kielmann (Co-Chair), VU Amsterdam, The Netherlands
Paolo Mori (Co-Chair), CNR, Italy

Session W/E5 | Chair: Thilo Kielmann

9:00 Opening

9:10 Multi-Objective Genetic Algorithm for Multi-Cloud Brokering
Alba Amato, Salvatore Venticinque, Beniamino Di Martino

9:30 Cloud Interoperability via Message Bus and Monitoring Integration
Vincent Chimaobi Emeakaroha, Philip D. Healy, Kaniz Fatema, John P. Morrison

9:50 Reducing VM Startup Time and Storage Costs by VM Image Content Consolidation
Kaveh Razavi, Liviu Mihai Razorea, Thilo Kielmann

10:10 Enhancing Data Interoperability of Cloud Infrastructures with Cloud Storage Services
Tamas Pflanzner, Attila Kertesz

Session W/F5 | Chair: Paolo Mori

11:00 Dependability and Security with Clouds-of-Clouds
Invited speaker: Miguel Correia, INESC-ID/Technical University of Lisbon, Portugal

11:35 Standardised SLAs - how far can we go?
Invited speaker: John M. Kennedy, Intel, Ireland

12:10 CONTRAIL Contest Competition

Program | Workshops
WORKSHOP DETAILS | TUESDAY | TRACK 5

WORKSHOPS

LSDVE 2013 – 1st Workshop on Large Scale Distributed Virtual Environments on Clouds and P2P

TUESDAY, AUGUST 27, 2013 | 14:30 - 18:00 | SuperC-5.31/32

Laura Ricci (Chair), Department of Computer Science, University of Pisa
Alexandru Iosup (Co-Chair), TU Delft, Delft, Netherlands
Andreas Petlund (Co-Chair), Simula Research Laboratory, Norway
Radu Prodan (Co-Chair), Institute of Computer Science, Innsbruck, Austria

Session W/G5 | Chair: Juan Durillo

14:30 Distributed Virtual Environments: From Client Server to Clouds and P2P
Laura Ricci

15:10 MeTRO: Low Latency Network Paths with Routers-on-Demand
Marc X. Makkes, Ana Oprescu, Rudolf Strijkers, Robert Meijer

15:30 Is today's public cloud suited to deploy hardcore realtime services?
Kjetil Raaen, Andreas Petlund, Pål Halvorsen

Session W/H5 | Chair: Andreas Petlund

16:30 Games for research: A comparative study of open source game projects
Stig Magnus Halvorsen, Kjetil Raaen

17:00 Toward Community-driven Interest Management for Distributed Virtual Environment
Emanuele Carlini, Patrizio Dazzi, Matteo Mordacchini, Laura Ricci

17:30 Workflow Scheduling in Amazon EC2
Juan J. Durillo, Radu Prodan

Tutorial Program

On Monday and Tuesday, August 26-27, alongside the Euro-Par 2013 workshop program, we offer one track of tutorials on parallel programming models and tools. All tutorials will take place in the Seminar Room 3 of the Computing Centre.

Please take into account that the Computing Center is a 15-minute walk away from the registration desk in the Main Building.

Monday, August 26, 2013 | 9:00-18:00 | Computing Center - Seminar Room 3

09:00-18:00	Tutorial VI-HPS - Session T/A | T/B | T/C | T/D

TOOLS FOR HIGH-PRODUCTIVITY SUPERCOMPUTING

Brian Wylie, Jülich Supercomputing Centre, Germany
Martin Schulz, Lawrence Livermore National Laboratory, USA

Tuesday, August 27, 2013 | 9:00-12:30 | Computing Center - Seminar Room 3

09:00-12:30	Tutorial OpenACC - Session T/E | T/F

INTRODUCTION TO OpenACC PROGRAMMING ON GPUS

Jiri Kraus, NVIDIA, Germany
Sandra Wienke, RWTH Aachen University, Germany

Tuesday, August 27, 2013| 14:30-18:00 | Computing Center - Seminar Room 3

14:30-18:00	Tutorial OpenMP - Session T/G | T/H

ADVANCED OpenMP

Timothy Mattson, Intel Corporation, USA
Christian Terboven, RWTH Aachen University, Germany

Tutorial VI-HPS
Tools for High-Productivity Supercomputing

MONDAY, AUGUST 26, 2013 | 9:00-18:00
COMPUTING CENTER - SEMINAR ROOM 3

Brian Wylie, Jülich Supercomputing Centre, Germany
Martin Schulz, Lawrence Livermore National Laboratory, USA

Developers are challenged to improve the reliability, performance and scalability of their applications on computer systems with increasingly large numbers of processors and cores, requiring ever more parallelism and efficiency with many processes and threads of execution. Use of appropriate tools can greatly assist productivity of both developers and computer systems, and is the founding motivation for the Virtual Institute - High Productivity Supercomputing (VI-HPS).

This full-day tutorial will give an overview and introduction to tools covering execution monitoring, correctness checking, and performance analysis of parallel applications at large to extreme scale.

Primary focus is presenting and demonstrating tools provided by VI-HPS partners that are mostly available as open-source and suited for a range of current HPC platforms and Linux clusters, such that attendees will know which tools to look for on their development and production platforms and how they can be applied to improve productivity.

Tutorial VI-HPS
Tools for High-Productivity Supercomputing

MONDAY, AUGUST 26, 2013 | 9:00-18:00
COMPUTING CENTER - SEMINAR ROOM 3

Session T/A

9:00 **Introduction and overview**
VI-HPS Linux ISO, parallel application engineering & workflow, extreme-scale case studies

Session T/B

11:00 **Execution monitoring, checking and debugging**
System/batchqueue monitoring, lightweight execution monitoring, portable performance counter access, MPI library profiling, MPI execution outlier detection, MPI memory usage checking, MPI correctness checking, lightweight stack trace debugging, task dependency debugging

Session T/C

14:30 **Integrated application execution profile and trace analysis**
Instrumentation and measurement, profile analysis examination, execution trace exploration, automated trace analysis, on-line automated analysis

Session T/D

16:30 **Complementary tools and utilities**
Parallel performance frameworks, cache usage analysis, performance analysis data-mining, parallel execution parametric studies, parallel file I/O optimization, process mapping generation/optimization assembly code optimization, etc.

17:45-18:00 **Review and discussion**

Tutorial OpenACC
Introduction to OpenACC Programming on GPUs

TUESDAY, AUGUST 27, 2013 | 9:00-12:30
COMPUTING CENTER - SEMINAR ROOM 3

Jiri Kraus, NVIDIA, Germany
Sandra Wienke, RWTH Aachen University, Germany

On the way to exascale computing, the HPC community has to focus on energy-efficient architectures. Here, a promising performance per watt ratio motivates the usage of accelerators like GPUs. While programming accelerators with low-level APIs may be difficult and can couple the code to a particular accelerator vendor, the directive-based accelerator programming paradigm OpenACC aims at high development productivity and portability. OpenACC enables the offloading of loops and regions of C/C++ and Fortran code to recent architectures like NVIDIA GPUs, AMD GPUs or Intel's Xeon Phi and delegates responsibility for low-level programming tasks to the compiler. This tutorial provides an introduction to OpenACC programming with focus on GPUs. It covers the overview of the NVIDIA GPU architecture and main concepts for code acceleration and data movement with OpenACC. We will introduce techniques to inter-operate with libraries to easily improve performance. Asynchronous data updates and kernel executions can be used to further increase performance and enable truly-heterogeneous programming. In a hands-on session, attendees develop their first OpenACC programs using the GPU cluster of RWTH Aachen University and PGI's OpenACC compiler.

Session T/E

9:00 **NVIDIA GPU Architecture and Basic OpenACC Concepts**
Motivation & Overview of NVIDIA GPU Architecture,
Basic OpenACC Concepts: parallel regions & data movement (with Hands-On)

Session T/F

11:30 **Advanced Aspects of OpenACC Programming**
Asynchronous Operations for heterogeneous computing (with Hands-On),
Inter-Operation with CUDA and Libraries

Tutorial OpenMP
Advanced OpenMP

TUESDAY, AUGUST 27, 2013 | 14:30-18:00
COMPUTING CENTER - SEMINAR ROOM 3

Timothy Mattson, Intel Corporation, USA
Christian Terboven, RWTH Aachen University, Germany

OpenMP is a popular, portable, widely supported and easy-to-use shared-memory model. Developers usually find OpenMP easy to learn. However, they are often disappointed with the performance and scalability of the resulting code. This disappointment stems not from shortcomings of OpenMP itself but rather from the lack of depth with which it is applied. Our advanced OpenMP programming tutorial addresses this critical need by exploring the implications of possible OpenMP parallelization strategies, both in terms of correctness and performance. We assume that attendees understand basic parallelization concepts and the fundamentals of OpenMP. We focus on performance aspects, such as data and thread locality on NUMA architectures, false sharing, and exploitation of vector units. We discuss language features in-depth, with emphasis on features recently added to OpenMP such as tasking. We close with an overview of the new OpenMP 4.0 directives for attached compute accelerators.


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Program | Tutorials
TUTORIAL DETAILS | TUESDAY

Session T/G

14:30 **OpenMP Overview**
OpenMP Overview, Core Concepts: Parallel Region, Worksharing, Nesting
Synchronization: Synchronization Constructs
The OpenMP Memory Model

15:15 **Techniques to Obtain High Performance with OpenMP: Memory Access**
Understanding Memory Access Patterns, Memory Placement and Thread Binding
How to build and use a simple Performance Model

Session T/H

16:30 **Techniques to Obtain High Performance with OpenMP: Vectorization**
Understanding Vector Microarchitectures
Vectorization with OpenMP 4.0

16:50 **Advanced Language features: Tasking**
The OpenMP Tasking Model
Tasking in Detail: Final, Mergeable, and Dependencies

17:15 **Techniques to improve Usability and Performance: Threadprivate and Atomics**
Taking care of global/static variables: threadprivate
Efficient Support for Atomic Operations

17:40 **An Overview of OpenMP 4.0 Features**
OpenMP for Attached Compute Accelerators, Cancellation, User-defined reductions


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TUTORIALS

Program | Keynotes & Panel

OVERVIEW

Wednesday, August 28, 2013 | Keynote 1 | 9:30-10:30

09:30 - 10:30	Keynote 1

Alok Choudhary
Northwestern University, USA

BIG DATA, EXASCALE SYSTEMS AND KNOWLEDGE DISCOVERY – THE NEXT FRONTIER FOR HPC

Thursday, August 29, 2013 | Keynote 2 | 9:00-10:00

09:00 - 10:00	Keynote 2

Arndt Bode
Leibniz Supercomputing Centre and
Technische Universität München, Germany

ENERGY TO SOLUTION: A NEW MISSION FOR PARALLEL COMPUTING

Friday, August 30, 2013 | Keynote 3 | 14:30-15:30

14:30 - 15:30	Keynote 3

Timothy Mattson
Intel Corporation, USA

RECENT DEVELOPMENTS IN PARALLEL PROGRAMMING: THE GOOD, THE BAD, AND THE UGLY

Thursday, August 29, 2013 | Panel | 16:30-18:00

16:30 - 18:00	Panel

ACCELERATORS – PERFORMANCE BOOSTERS OR PRODUCTIVITY KILLERS?

Alok Choudhary

Northwestern University, USA

BIG DATA, EXASCALE SYSTEMS AND KNOWLEDGE DISCOVERY – THE NEXT FRONTIER FOR HPC

WEDNESDAY, AUGUST 28, 2013 | 9:30 - 10:30 | MAIN BUILDING - AULA

Abstract

Knowledge discovery in science and engineering has been driven by theory, experiments and by large-scale simulations on high-performance computers. Modern experiments and simulations involving satellites, telescopes, high-throughput instruments, sensors, and supercomputers yield massive amounts of data. The world, including social communities, is creating massive amounts of data at an astonishing pace. Just consider Facebook, Google, articles, papers, images, videos and others. But even more complex is the network that connects the creators of data. Altogether these are termed as BIG DATA.

This represents a significant and interesting challenge for HPC and opens opportunities for accelerating knowledge discovery. Processing, mining and analyzing this data effectively and efficiently will be a critical component of the knowledge discovery process, as we can no longer rely upon traditional ways of dealing with the data due to its scale and speed.

Interestingly, an exascale system can be thought of as another instrument generating "big data". But unlike most other instruments, such a system also presents an opportunity for big data analytics. Thus the fundamental question is - what are the challenges and opportunities for exascale systems to be an effective platform for not only performing traditional simulations, but for them to be also suitable for data-intensive and data driven computing to accelerate time to insights? That has implications on how computing, communication, analytics and I/O are performed. This talk will address these emerging challenges and opportunities.

Biography

Alok Choudhary is a John G. Searle Professor of Electrical Engineering and Computer Science and a professor at Kellogg School of Management. He is also the founder and CEO of Voxsup Inc., a big data analytics and social media marketing company. He received the National Science Foundation's Young Investigator Award in 1993.

He has also received an IEEE Engineering Foundation award, an IBM Faculty Development award, and an Intel Research Council award. He is a fellow of IEEE, ACM and AAAS. His research interests are in high-performance computing, data intensive computing, scalable data mining, computer architecture, high-performance I/O systems and software and their applications.

Alok Choudhary has published more than 400 papers in various journals and conferences and has graduated 30 PhD students. Techniques developed by his group can be found on every modern processor and scalable software developed by his group can be found on most supercomputers.

Alok Choudhary's work has appeared in many traditional media including New York Times, Chicago Tribune, The Telegraph, TV channels such as ABC, PBS and many international media outlets all over the world.

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Arndt Bode
Leibniz Supercomputing Centre and
Technische Universität München, Germany

ENERGY TO SOLUTION: A NEW MISSION FOR PARALLEL COMPUTING

THURSDAY, AUGUST 29, 2013 | 9:00 - 10:00 | MAIN BUILDING - AULA

Abstract

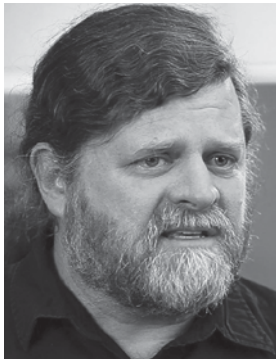
A short historical overview on the research goals in parallel and distributed computing during the past 40 years is given. "Energy to solution" is a new important area in research and development, dictated by the wish for a green environment and the necessity of avoiding excessive energy bills for modern supercomputers.

The talk gives an overview on the contributing parameters: energy efficient data center infrastructure, computer architectures, system software and tools as well as efficient algorithms. It reports on first results in the context of SuperMUC at LRZ.

Biography

Prof. Dr. Arndt Bode is a full professor for Informatics at Technische Universität München since 1987, leading a research group for computer architecture and parallel and distributed computing.

Since October 2008 he is also heading the Leibniz Supercomputer Centre of the Bavarian Academy of Sciences and Humanities in Munich. From 1999 to 2008 he was Vice President and CIO of Technische Universität München. He is author of more than 200 publications on parallel and distributed architectures, programming tools and applications.



Timothy Mattson
Intel Corporation, USA

RECENT DEVELOPMENTS IN PARALLEL PROGRAMMING: THE GOOD, THE BAD, AND THE UGLY

FRIDAY, AUGUST 30, 2013 | 14:30 - 15:30 | MAIN BUILDING - AULA

Abstract
As hardware developments have made parallel computers nearly ubiquitous and "big data" has given us the killer app we need to make all this parallel hardware matter, the software world has responded with new and updated standards to support parallel programmers.

In this talk, we will discuss three important developments; the soon to be released next version of OpenCL, the memory model in C++'11, and the combinatorial BLAS for graph analytics. I leave it to the audience to assign each of these to the appropriate categories "the good", "the bad" and "the ugly".

Biography
Tim Mattson is a principle engineer in Intel's Microprocessor and Programming Research laboratory. He is an old fashioned application programmer with experience in quantum chemistry, seismic signal processing, and molecular modeling and has used more parallel programming models than he can keep track of. Tim was part of the teams that created OpenMP and OpenCL.

Most recently, he has been working on the memory and execution models for the next major revision of OpenCL. Tim has published extensively including the books Patterns for Parallel Programming (with B. Sanders and B. Massingill, Addison Wesley, 2004), An Introduction to Concurrency in Programming Languages (with M. Sottile and C. Rasmussen, CRC Press, 2009), and the OpenCL Programming Guide (with A Munshi, B. Gaster, J. Fung, and D. Ginsburg, Addison Wesley, 2011).

ACCELERATORS – PERFORMANCE BOOSTERS OR PRODUCTIVITY KILLERS?

THURSDAY, AUGUST 29, 2013 | 16:30 - 18:00 | MAIN BUILDING - AULA

Chair: Matthias Müller, RWTH Aachen University, Germany

Panelists:

Luiz DeRose	Cray Inc., USA
Axel Köhler	NVIDIA, Germany
Satoshi Matsuoka	Tokyo Institute of Technology, Japan
Timothy Mattson	Intel Corporation, USA
Naoya Tamura	Fujitsu, Germany

Abstract
Accelerating the computation with the help of special purpose devices has a long history in high-performance computing. The latest trend has been sparked with the use of graphics cards as general processing devices. The performance and energy efficiency measured in Flops/Watt is impressive.

The downside is the increased complexity of hybrid systems. Initial approaches to program those systems were vendor specific and rather complex to use. This was addressed with the invention and adaption of various programming models. Program developers now face the challenge of choosing among a vast number of options. This panel will discuss the current situation of accelerators and analyze long term-trends to provide insight and guidance for the attendees to make the right choice regarding the use of accelerators.

The following topics will be covered by regular Euro-Par 2013 sessions:

Topic 1:	Support Tools and Environments	(Session B1)
Topic 2:	Performance Prediction and Evaluation	(Session A1)
Topic 3:	Scheduling and Load Balancing	(Session A2/B2/F1)
Topic 4:	High-Performance Architectures and Compilers	(Session C3)
Topic 5:	Parallel and Distributed Data Management	(Session E4)
Topic 6:	Grid, Cluster and Cloud Computing	(Session E1/F4)
Topic 7:	Peer-to-Peer Computing	(Session A4)
Topic 8:	Distributed Systems and Algorithms	(Session A4/B4)
Topic 9:	Parallel and Distributed Programming	(Session C1)
Topic 10:	Parallel Numerical Algorithms	(Session C2/D2)
Topic 11:	Multicore and Manycore Programming	(Session A3/B3/D3)
Topic 12:	Theory and Algorithms for Parallel Computation	(Session F2)
Topic 13:	High-Performance Networks and Communication	(Session C4)
Topic 14:	High-Performance and Scientific Applications	(Session D2/E2)
Topic 15:	GPU and Accelerator Computing	(Session D3/E3/F3)
Topic 16:	Extreme-Scale Computing	(Session D2/E2)

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Program | Sessions
OVERVIEW

REGULAR SESSIONS

Wednesday, August 28, 2013

08:45 - 09:30	Opening (V)			
09:30 - 10:30	Keynote 1 (V)			
10:30 - 11:00	Coffee Break			
11:00 - 12:30	Session A1 (I)	Session A2 (II)	Session A3 (III)	Session A4 (IV)
12:30 - 14:30	Lunch Break			
14:30 - 16:00	Session B1 (I)	Session B2 (II)	Session B3 (III)	Session B4 (IV)
16:00 - 16:30	Coffee Break			

Thursday, August 29, 2013

09:00 - 10:00	Keynote 2 (V)			
10:00 - 10:30	Coffee Break			
10:30 - 12:30	Session C1 (I)	Session C2 (II)	Session C3 (III)	Session C4 (IV)
12:30 - 14:30	Lunch Break			
14:30 - 16:00	Session D1 (I)	Session D2 (II)	Session D3 (III)	
16:00 - 16:30	Coffee Break			
16:30 - 18:00	Panel (V)			

Friday, August 30, 2013

09:00 - 10:30	Session E1 (I)	Session E2 (II)	Session E3 (III)	Session E4 (IV)
10:30 - 11:00	Coffee Break			
11:00 - 12:30	Session F1 (I)	Session F2 (II)	Session F3 (III)	Session F4 (IV)
12:30 - 14:30	Lunch Break			
14:30 - 15:30	Keynote 3 (V)			
15:30 - 16:00	Closing (V)			

Rooms: Regular Sessions | Keynotes & Panel | Conference Opening & Closing

(I) Main Building - Lecture Hall IV
(II) SuperC - Ford
(III) SuperC - Generali
(IV) SuperC - 5.31/32
(V) Main Building - Aula

Program | Regular Sessions
OVERVIEW


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Wednesday, August 28, 2013

08:45-09:30 CONFERENCE OPENING

Room: Main Building - Aula

09:30 - 10:30 KEYNOTE 1

Chair: Felix Wolf | Room: Main Building - Aula

Alok Choudhary
Northwestern University, USA
Big Data, Exascale Systems and Knowledge Discovery – The Next Frontier for HPC

11:00-12:30 SESSIONS A1 - A4:

Session A1 Performance Prediction and Evaluation

Chair: Paolo Bientinesi | Room: Main Building - Lecture Hall IV

Alignment-Based Metrics for Trace Comparison
Matthias Weber (Technische Universität Dresden, Germany)
Kathryn Mohror (Lawrence Livermore National Laboratory, USA)
Martin Schulz (Lawrence Livermore National Laboratory, USA)
Bronis R. de Supinski (Lawrence Livermore National Laboratory, USA)
Holger Brunst (Technische Universität Dresden, Germany)
Wolfgang E. Nagel (Technische Universität Dresden, Germany)

Validation and Uncertainty Assessment of Extreme-Scale HPC Simulation through Bayesian Inference
Jeremiah J. Wilke (Sandia National Laboratories, USA)
KhachikSargsyan (Sandia National Laboratories, USA)
Joseph P. Kenny (Sandia National Laboratories, USA)
Bert Debusschere (Sandia National Laboratories, USA)
Habib N. Najm (Sandia National Laboratories, USA)
Gilbert Hendry (Sandia National Laboratories, USA)

Dynamic Thread Pinning for Phase-Based OpenMP Programs
Abdelhafid Mazouz (University of Versailles Saint-Quentin-en-Yvelines, France)
Sid-Ahmed-Ali Touati (University of Nice, France)
Denis Barthou (University of Bordeaux, France)

Session A2 Scheduling and Load Balancing

Chair: Stefan Lankes | Room: SuperC - Ford

Energy-Efficient Scheduling with Time and Processors Eligibility Restrictions
Xibo Jin (Chinese Academy of Sciences, China)
Fa Zhang (Chinese Academy of Sciences, China)
Ying Song (Chinese Academy of Sciences, China)
Liya Fan (Chinese Academy of Sciences, China)
Zhiyong Liu (Chinese Academy of Sciences, China)

A (2+epsilon) - Approximation for Scheduling Parallel Jobs in Platforms
Pierre-Francois Dutot (Grenoble Institute of Technology, France)
Klaus Jansen (University of Kiel, Germany)
Christina Robenek (University of Kiel, Germany)
Denis Trystram (Grenoble Institute of Technology, France)

Scheduling Jobs with Multiple Non-uniform Tasks
Venkatesan Chakaravarthy (IBM Research, India)
Anamitra Roy Choudhury (IBM Research, India)
Sambuddha Roy (IBM Research, India)
Yogish Sabharwal (IBM Research, India)

Session A3 Multicore and Manycore Programming

Chair: Luiz DeRose | Room: SuperC - Generali

Assessing the Performance of OpenMP Programs on the Intel Xeon Phi
Dirk Schmidl (RWTH Aachen University, Germany)
Tim Cramer (RWTH Aachen University, Germany)
Sandra Wienke (RWTH Aachen University, Germany)
Christian Terboven (RWTH Aachen University, Germany)
Matthias S. Müller (RWTH Aachen University, Germany)

A Hybrid Parallel Barnes-Hut Algorithm for GPU and Multicore Architectures
Hannes Hannak (University of Stuttgart, Germany)
Hendrik Hochstetter (University of Siegen, Germany)
Wolfgang Blochinger (University of Stuttgart, Germany)

REGULAR SESSIONS

A Generic High-Performance Method for Deinterleaving Scientific Data
Eric Schendel (North Carolina State University, USA)
Steve Harenberg (North Carolina State University, USA)
Houjun Tang (North Carolina State University, USA)
Venkatram Vishwanath (Argonne National Laboratory, USA)
Michael Papka (Argonne National Laboratory, USA)
Nagiza Samatova (North Carolina State University, USA; Oak Ridge National Laboratory, USA)

Session A4 Peer-to-Peer Computing / Distributed Systems and Algorithms

Chair: Fernando Silva | Room: SuperC - 5.31/32

Design and Implementation of a Scalable Membership Service for Supercomputer Resiliency-Aware Runtime
Yoav Tock (IBM Research, Israel)
Benjamin Mandler (IBM Research, Israel)
Jose Moreira (IBM T.J. Watson Research Center, USA)
Terry Jones (Oak Ridge National Laboratory, USA)

Gunther: Search-Based Auto-Tuning of MapReduce
Guangdeng Liao (Intel Labs, USA)
Kushal Datta (Intel Labs, USA)
Theodore Willke (Intel Labs, USA)

Multi-criteria Checkpointing Strategies: Response-Time versus Resource Utilization
Aurelien Bouteiller (University of Tennessee Knoxville, USA)
Franck Cappello (University of Illinois at Urbana Champaign, USA; INRIA, France)
Jack Dongarra (University of Tennessee Knoxville, USA)
Amina Guermouche (University Versailles St Quentin, France)
Thomas Herault (University of Tennessee Knoxville, USA)
Yves Robert (Ecole Normale Supérieure de Lyon, France; University of Tennessee Knoxville, USA)

14:30-16:00 SESSIONS B1 - B4:

Session B1 Support Tools and Environments

Chair: Ali Jannesari | Room: Main Building - Lecture Hall IV

Synchronization Identification through On-the-Fly Test
Xiang Yuan (Chinese Academy of Sciences, China)
Zhenjiang Wang (Chinese Academy of Sciences, China)
Chenggang Wu (Chinese Academy of Sciences, China)
Pen-Chung Yew (University of Minnesota at Twin-Cities, USA)
Wenwen Wang (Chinese Academy of Sciences, China)
Jianjun Li (Chinese Academy of Sciences, China)
Di Xu (IBM Research, China)

Fast Full-System Execution-Driven Performance Simulator for Blue Gene/Q
Diego S. Gallo (IBM Research, Brazil)
Jose R. Brunheroto (IBM T. J. Watson Research Center, USA)
Kyung D. Ryu (IBM T. J. Watson Research Center, USA)

Session B2 Scheduling and Load Balancing

Chair: Ramin Yahyapour | Room: SuperC - Ford

Workflow Fairness Control on Online and Non-clairvoyant Distributed Computing Platforms
Rafael Ferreira Da Silva (University of Lyon, France; Centre National de la Recherche Scientifique, France)
Tristan Glatard (University of Lyon, France; Centre National de la Recherche Scientifique, France)
Frédéric Desprez (INRIA, France)

How to be a Successful Thief: Feudal Work Stealing for Irregular Divide-and-Conquer Applications on Heterogeneous Distributed Systems
Vladimir Janjic (University of St Andrews, UK)
Kevin Hammond (University of St Andrews, UK)

Scheduling HPC Workflows for Responsiveness and Fairness with Networking Delays and Inaccurate Estimates of Execution Times
Andrew Burkimsher (University of York, UK)
Iain Bate (University of York, UK)
Leandro Indrusiak (University of York, UK)

Session B3 Multicore and Manycore Programming

Chair: Felix Wolf | Room: SuperC - Generali

Transparent Support for Partial Rollback in Software Transactional Memories
Alice Porfirio (Sapienza University, Italy)
Alessandro Pellegrini (Sapienza University, Italy)
Pierangelo Di Sanzo (Sapienza University, Italy)
Francesco Quaglia (Sapienza University, Italy)

Lightweight Contention Management for Efficient Compare-and-Swap Operations
Ilya Mirsky (Ben-Gurion University, Israel)
Danny Hendler (Ben-Gurion University, Israel)
Dave Dice (Sun Labs at Oracle, USA)

MacroDB: Scaling Database Engines on Multicores
João Soares (University Nova de Lisboa, Portugal)
Nuno Preguica (University Nova de Lisboa, Portugal)
João Lourenço (University Nova de Lisboa, Portugal)

Session B4 Distributed Systems and Algorithms

Chair: Frederic Desprez | Room: SuperC - 5.31/32

On the Scalability of Snapshot Isolation
Masoud Saeida Ardekani (University Pierre et Marie Curie, France)
Pierre Sutra (University of Neuchatel, Switzerland)
Marc Shapiro (INRIA, France; University Pierre et Marie Curie, France)
Nuno Preguica (University Nova de Lisboa, Portugal)

Efficient Event Prewarning for Sensor Networks with Multi Microenvironments
Yinglong Li (Renmin University of China, China)

Efficient Parallel Block-Max WAND Algorithm
Veronica Gil Costa (Universidad Nacional de San Luis, Argentina)
Oscar Rojas (Universidad de Santiago de Chile, Chile)
Mauricio Marin (Universidad de Santiago de Chile, Chile)

Thursday, August 29, 2013

09:00 - 10:00 KEYNOTE 2

Chair: Dieter an Mey | Room: Main Building - Aula
Arndt Bode
Leibniz Supercomputing Centre and
Technische Universität München, Germany
Energy to solution: a new mission for parallel computing

10:30 - 12:30 SESSIONS C1 - C4:

Session C1 Parallel and Distributed Programming

Chair: Michael Philippsen | Room: Main Building - Lecture Hall IV

Examining the Expert Gap in Parallel Programming
Sebastian Nanz (ETH Zurich, Switzerland)
Scott West (ETH Zurich, Switzerland)
Kaue Soares Da Silveira (Google Inc. Zurich, Switzerland)

Programming with BSP Homomorphisms
Joeffrey Legaux (Université d'Orléans, France)
Zhenjiang Hu (National Institute of Informatics, Japan)
Frédéric Loulergue (Université d'Orléans, France)
Kiminori Matsuzaki (Kochi University of Technology, Japan)
Julien Tesson (Université Paris Est Créteil, France)

Giraphx: Parallel Yet Serializable Large-Scale Graph Processing
Serafettin Tasci (SUNY Buffalo, USA)
Murat Demirbas (SUNY Buffalo, USA)

Hugh: A Semantically Aware Universal Construction for Transactional Memory Systems
Craig Sharp (Newcastle University, UK)
Graham Morgan (Newcastle University, UK)

REGULAR SESSIONS

Session C2 Parallel Numerical Algorithms

Chair: Matthias Bolten | Room: SuperC - Ford

Cluster Optimization and Parallelization of Simulations with Dynamically Adaptive Grids
Martin Schreiber (Technische Universität München, Germany)
Tobias Weinzierl (Technische Universität München, Germany)
Hans-Joachim Bungartz (Technische Universität München, Germany)

Discrete Adjoints in PETSc through dco/c++ and Adjoint MPI
Uwe Naumann (RWTH Aachen University, Germany)
Johannes Lotz (RWTH Aachen University, Germany)
Michel Schanen (RWTH Aachen University, Germany)
Max Sagebaum (RWTH Aachen University, Germany)

Evaluation of Two Formulations of the Conjugate Gradients Method with Transactional Memory
Martin Schindewolf (Karlsruhe Institute of Technology, Germany)
Bjoern Rocker (Robert-Bosch-GmbH, Germany)
Wolfgang Karl (Karlsruhe Institute of Technology, Germany)
Vincent Heuveline (Karlsruhe Institute of Technology, Germany)

Multifrontal QR Factorization for Multicore Architectures over Runtime Systems
Emmanuel Agullo (INRIA, France)
Alfredo Buttari (Centre National de la Recherche Scientifique, France)
Abdou Guermouche (Université de Bordeaux, France)
Florent Lopez (Université Paul Sabatier, France)

Session C3 High-Performance Architectures and Compilers

Chair: Christian Lengauer | Room: SuperC - Generali

Adaptive Granularity Control in Task Parallel Programs Using Multiversioning
Peter Thoman (University of Innsbruck, Austria)
Herbert Jordan (University of Innsbruck, Austria)
Thomas Fahringer (University of Innsbruck, Austria)

Towards Efficient Dynamic LLC Home Bank Mapping with NoC-Level Support
Mario Lodde (Universitat Politècnica de València, Spain)
Jose Flich (Universitat Politècnica de València, Spain)
Manuel E. Acacio (University of Murcia, Spain)

Online Dynamic Dependence Analysis for Speculative Polyhedral Parallelization
Alexandra Jimborean (University of Uppsala, Sweden)
Philippe Clauss (INRIA, France; University of Strasbourg, France)
Juan Manuel Martinez (INRIA, France; University of Strasbourg, France)
Aravind Sukumaran Rajam (INRIA, France; University of Strasbourg, France)

VGTS: Variable Granularity Transactional Snoop
Ehsan Atoofian (Lakehead University, Canada)

Session C4 High-Performance Networks and Communication

Chair: Michael Alexander | Room: SuperC - 5.31/32

Making the Network Scalable: Inter-subnet Routing in InfiniBand
Bartosz Bogdanski (Oracle Corporation, USA)
Bjørn Dag Johnsen (Oracle Corporation, USA)
Sven-Arne Reinemo (Simula Research Laboratory, Norway)
Jose Flich (Universidad Politecnica de Valencia, Spain)

BBQ: A Straightforward Queuing Scheme to Reduce HoL-Blocking in High-Performance Hybrid Networks
Pedro Yebenes Segura (University of Castilla-La Mancha, Spain)
Jesus Escudero-Sahuquillo (University of Castilla-La Mancha, Spain)
Crispin Gomez Requena (University of Castilla-La Mancha, Spain)
Pedro Javier Garcia (University of Castilla-La Mancha, Spain)
Francisco J. Quiles (University of Castilla-La Mancha, Spain)
Jose Duato (University of Castilla-La Mancha, Spain)

Accelerating Communication-Intensive Parallel Workloads Using Commodity Optical Switches and a Software-Configurable Control Stack
Diego Lugones (Dublin City University, Ireland)
Konstantinos Christodoulopoulos (Trinity College Dublin, Ireland)
Kostas Katrinis (IBM Research, Ireland)
Marco Ruffini (Trinity College Dublin, Ireland)
Martin Collier (Dublin City University, Ireland)
Donal O'Mahony (Trinity College Dublin, Ireland)

Dynamic Protocol Tuning Algorithms for High Performance Data Transfers
Engin Arslan (University at Buffalo (SUNY), USA)
Brandon Ross (University at Buffalo (SUNY), USA)
Tevfik Kosar (University at Buffalo (SUNY), USA)

14:30 - 16:00 SESSIONS D1 - D3:

Session D1 Grid, Cluster and Cloud Computing

Chair: Ron Perrott | Room: Main Building - Lecture Hall IV

Scheduling Jobs in the Cloud Using On-Demand and Reserved Instances
Siqi Shen (Delft University of Technology, Netherlands)
Kefeng Deng (National University of Defense Technology, China)
Alexandru Iosup (Delft University of Technology, Netherlands)
Dick Epema (Delft University of Technology, Netherlands)

On-Line, Non-clairvoyant Optimization of Workflow Activity Granularity on Grids
Rafael Ferreira Da Silva (University of Lyon, France; Centre National de la Recherche Scientifique, France)
Tristan Glatard (University of Lyon, France; Centre National de la Recherche Scientifique, France)
Frederic Desprez (INRIA, France)

Application-centric Resource Provisioning for Amazon EC2 Spot Instances
Sunirmal Khatua (University of Calcutta, India)
Nandini Mukherjee (Jadavpur University, India)

Session D2 Parallel Numerical Algorithms / High-Performance and Scientific Applications

Chair: Thomas Ludwig | Room: SuperC - Ford

Fast Methods for Computing Selected Elements of the Green's Function in Massively Parallel Nanoelectronic Device Simulations
Andrey Kuzmin (Universita della Svizzera italiana, Switzerland)

Mathieu Luisier (ETH Zurich, Switzerland)
Olaf Schenk (Universita della Svizzera italiana, Switzerland)

Hierarchical Parallel Algorithm for Modularity-Based Community Detection Using GPUs
Chun Yew Cheong (A*STAR, Singapore)
Huynh Phung Huynh (A*STAR, Singapore)
David Lo (Singapore Management University, Singapore)
Rick Siow Mong Goh (A*STAR, Singapore)

GWAS on GPUs: Streaming Data from HDD for Sustained Performance
Lucas Beyer (RWTH Aachen University, Germany)
Paolo Bientinesi (RWTH Aachen University, Germany)

Session D3 Multicore and Manycore Programming / GPU and Accelerator Computing

Chair: Wolfgang Nagel | Room: SuperC - Generali

Towards a Scalable Microkernel Personality for Multicore Processors
Jilong Kuang (Samsung US R&D Center, USA)
Daniel Waddington (Samsung US R&D Center, USA)
Chen Tian (Samsung US R&D Center, USA)

An Implementation of the Codelet Model
Joshua Suetterlein (University of Delaware, USA)
Stéphane Zuckerman (University of Delaware, USA)
Guang R. Gao (University of Delaware, USA)

Algorithmic Skeleton Framework for the Orchestration of GPU Computations
Ricardo Marques (Universidade Nova de Lisboa, Portugal)
Hervé Paulino (Universidade Nova de Lisboa, Portugal)
Fernando Alexandre (Universidade Nova de Lisboa, Portugal)
Pedro Medeiros (Universidade Nova de Lisboa, Portugal)

REGULAR SESSIONS

16:30 - 18:00 PANEL – "ACCELERATORS – PERFORMANCE BOOSTERS OR PRODUCTIVITY KILLERS?"
Chair: Matthias Müller | Room: Main Building - Aula
Panelists:
Luiz DeRose - Cray Inc., USA
Axel Köhler - NVIDIA, Germany
Satoshi Matsuoka - Tokyo Institute of Technology, Japan
Timothy Mattson - Intel Corporation, USA
Naoya Tamura - Fujitsu, Germany

Friday, August 30, 2013

9:00 - 10:30 SESSIONS E1 - E4:

Session E1 Grid, Cluster and Cloud Computing

Chair: Alexandru Costan | Room: Main Building - Lecture Hall IV

PonIC: Using Stratosphere to Speed Up Pig Analytics
Vasiliki Kalavri (KTH - Royal Institute of Technology, Sweden)
Vladimir Vlassov (KTH - Royal Institute of Technology, Sweden)
Per Brand (Swedish Institute of Computer Science, Sweden)

MROrder: Flexible Job Ordering Optimization for Online MapReduce Workloads
Shanjiang Tang (Nanyang Technological University, Singapore)
Bu Sung Lee (Nanyang Technological University, Singapore)
Bingsheng He (Nanyang Technological University, Singapore)

Leveraging Collaborative Content Exchange for On-Demand VM Multi-Deployments in IaaS Clouds
Bogdan Nicolae (IBM Research, Ireland)
Mustafa Rafique (IBM Research, Ireland)

Session E2 High-Performance and Scientific Applications

Chair: Turlough Downes | Room: SuperC - Ford

A Scalable Barotropic Mode Solver for the Parallel Ocean Program
Yong Hu (Tsinghua University, China)

Xiaomeng Huang (Tsinghua University, China)
Xiaoge Wang (Tsinghua University, China)
Haohuan Fu (Tsinghua University, China)
Shizhen Xu (Tsinghua University, China)
Huabin Ruan (Tsinghua University, China)
Wei Xue (Tsinghua University, China)
Guangwen Yang (Tsinghua University, China)

Heterogeneous Combinatorial Candidate Generation
Fahad Khalid (Hasso Plattner Institute for Software Systems Engineering, Germany)
Zoran Nikoloski (Max Planck Insitute of Molecular Plant Physiology, Germany)
Peter Tröger (Hasso Plattner Institute for Software Systems Engineering, Germany)
Andreas Polze (Hasso Plattner Institute for Software Systems Engineering, Germany)

Solving a Least-Squares Problem with Algorithmic Differentiation and OpenMP
Michael Foerster (RWTH Aachen University, Germany)
Uwe Naumann (RWTH Aachen University, Germany)

Session E3 GPU and Accelerator Computing

Chair: Josef Weidendorfer | Room: SuperC - Generali

High-Resolution Power Profiling of GPU Functions Using Low-Resolution Measurement
Jens Lang (Chemnitz University of Technology, Germany)
Gudula Rünger (Chemnitz University of Technology, Germany)

Power/Performance Trade-Offs of Small Batched LU Based Solvers on GPUs
Oreste Villa (Pacific Northwest National Laboratory, USA)
Massimiliano Fatica (NVIDIA, USA)
Nitin Gawande (Pacific Northwest National Laboratory, USA)
Antonino Tumeo (Pacific Northwest National Laboratory, USA)

Optimizing 3D Convolutions for Wavelet Transforms on CPUs with SSE Units and GPUs
Brice Videau (Grenoble University, France)
Vania Marangozova-Martin (Grenoble University, France)
Luigi Genovese (CEA, France); Thierry Deutsch (CEA, France)

REGULAR SESSIONS

Session E4 Parallel and Distributed Data Management

Chair: Maria S. Perez-Hernandez | Room: SuperC - 5.31/32

Multi-level Clustering on Metric Spaces Using a Multi-GPU Platform

Ricardo J. Barrientos (Complutense University of Madrid, Spain)
José I. Gómez (Complutense University of Madrid, Spain)
Christian Tenllado (Complutense University of Madrid, Spain)
Manuel Prieto Matias (Complutense University of Madrid, Spain)
Pavel Zezula (Masaryk University, Czech Republic)

The Contention-Friendly Tree

Tyler Crain (IRISA, France)
Vincent Gramoli (The University of Sydney, Australia)
Michel Raynal (IRISA, France)

11:00 - 12:30 SESSIONS F1 - F4:

Session F1 Scheduling and Load Balancing

Chair: Martin Schulz | Room: Main Building - Lecture Hall IV

FLEX-MPI: An MPI Extension for Supporting Dynamic Load Balancing on Heterogeneous Non-dedicated Systems

Gonzalo Martin (Universidad Carlos III de Madrid, Spain)
Maria-Cristina Marinescu (Barcelona Supercomputing Center, Spain)
David E. Singh (Universidad Carlos III de Madrid, Spain)
Jesús Carretero (Universidad Carlos III de Madrid, Spain)

Enhancing Concurrency in Distributed Transactional Memory through Commutativity

Junwhan Kim (Virginia Tech, USA)
Roberto Palmieri (Virginia Tech, USA)
Binoy Ravindran (Virginia Tech, USA)

Session F2 Theory and Algorithms for Parallel Computation

Chair: Luc Bouge | Room: SuperC - Ford

Model and Complexity Results for Tree Traversals on Hybrid Platforms

Julien Herrmann (INRIA, France; Ecole Normale Supérieure de Lyon, France)
Loris Marchal (INRIA, France; Ecole Normale Supérieure de Lyon, France)
Yves Robert (INRIA, France; Ecole Normale Supérieure de Lyon, France; University of Tenessee Knoxville, USA)

Efficient Parallel and External Matching

Marcel Birn (Karlsruhe Institute of Technology, Germany)
Vitaly Osipov (Karlsruhe Institute of Technology, Germany)
Peter Sanders (Karlsruhe Institute of Technology, Germany)
Christian Schulz (Karlsruhe Institute of Technology, Germany)
Nodari Sitchinava (Karlsruhe Institute of Technology, Germany)

Splittable Single Source-Sink Routing on CMP Grids: A Sublinear Number of Paths Suffice

Adrian Kosowski (INRIA, France)
Przemyslaw Uznanski (INRIA, France)

Session F3 GPU and Accelerator Computing

Chair: Bernd Mohr | Room: SuperC - Generali

GPUMAFIA: Efficient Subspace Clustering with MAFIA on GPUs

Andrew Adinetz (Forschungszentrum Jülich, Germany)
Jiri Kraus (NVidia GmbH, Germany)
Jan Meinke (Forschungszentrum Jülich, Germany)
Dirk Pleiter (Forschungszentrum Jülich, Germany)

GPU Accelerated Maximum Cardinality Matching Algorithms for Bipartite Graphs

Mehmet Deveci (The Ohio State University, USA)
Kamer Kaya (The Ohio State University, USA)
Bora Ucar (Centre National de la Recherche Scientifique, France; Ecole Normale Supérieure de Lyon, France)
Umit Catalyurek (The Ohio State University, USA)

On-Board Multi-GPU Molecular Dynamics

Marcos Novalbos (Universidad Rey Juan Carlos, Spain)
Jaime Gonzalez (Plebiotic S.L., Spain)
Miguel Angel Otaduy (Universidad Rey Juan Carlos, Spain)
Alvaro Lopez-Medrano (Plebiotic S.L., Spain)
Alberto Sanchez (Universidad Rey Juan Carlos, Spain)

REGULAR SESSIONS

Session F4 Grid, Cluster and Cloud Computing

Chair: Henk Sips | Room: SuperC - 5.31/32

Energy and Carbon-Efficient Placement of Virtual Machines in Distributed Cloud Data Centers
Atefeh Khosravi (University of Melbourne, Australia)
Saurabh Garg (University of Melbourne, Australia)
Rajkumar Buyya (University of Melbourne, Australia)

Reconfiguration Stability of Adaptive Distributed Parallel Applications through a Cooperative Predictive Control Approach
Gabriele Mencagli (University of Pisa, Italy)
Marco Vanneschi (University of Pisa, Italy)
Emanuele Vespa (University of Pisa, Italy)

On the Use of a Proportional-Share Market for Application SLO Support in Clouds
Stefania Costache (EDF R&D, France)
Nikos Parlavantzas (INSA, France)
Christine Morin (INSA, France)
Samuel Kortas (EDF R&D, France)

14:30 - 15:30 KEYNOTE 3

Chair: Bernd Mohr | Room: Main Building - Aula

Timothy Mattson
Intel Corporation, USA
Recent developments in parallel programming: the good, the bad, and the ugly

15:30 - 16:00 CONFERENCE CLOSING

Room: Main Building - Aula

TUESDAY, AUGUST 27, 2013 | 18:30-20:30

Venue:

Altes Kurhaus (Old Kurhaus) | Ballsaal
Komphausbadstraße 19 | 52062 Aachen

A welcome reception will be held in the Old Kurhaus in Aachen downtown. Located in the heart of Aachen, the Old Kurhaus was built in the beginning of the 18th century by architect Jakob Couvens. With its famous baroque ballroom and its beautiful interior architecture, it offers a glamorous setting for celebrations and ceremonial and cultural events.

By foot/bus:

From the Main Building it's a 15-minute walk to the Old Kurhaus. The nearest bus station is "Aachen Bushof". Depending on where you come from, you can use the lines 7, 27, 33, 37, 77 and more.


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Social Events
CONFERENCE BANQUET


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THURSDAY, AUGUST 29, 2013 | 18:45

Venue:

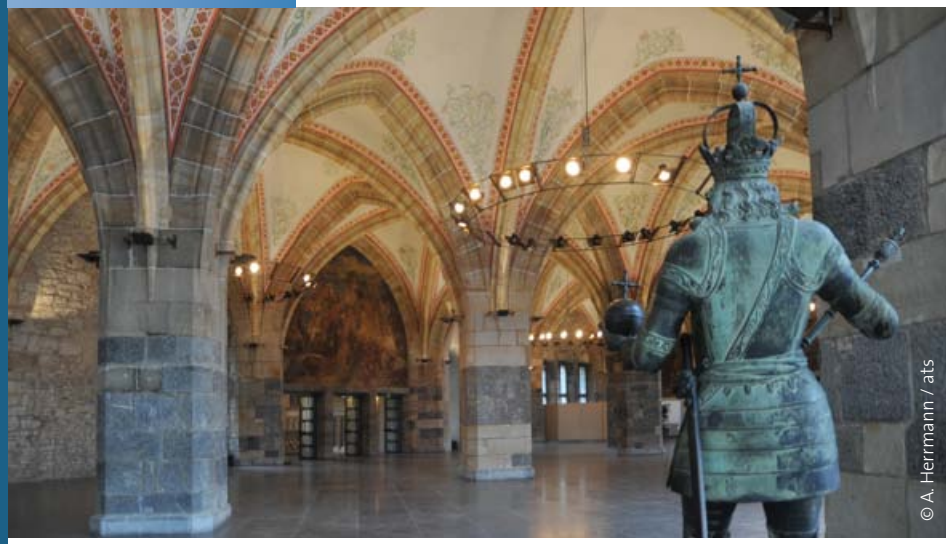
Coronation Hall at Aachen Town Hall | Markt 1 | 52062 Aachen

Our conference banquet will take place in the Coronation Hall of Aachen's Town Hall with its famous Rethel frescoes dating from the 19th century and copies of the Imperial Crown Jewels as well as the gothic and baroque furniture of the building.

Before the gala menu at 19:30, we would like to invite you to an interlude by the Philipp-Neri-Quartett while enjoying a chilled drink. The interlude will be held in the White Hall which was decorated in the 18th century as a small party room with baroque stucchi.

By foot/bus:

From the Main Building it's a 10-minute walk to the Town Hall (see the fold-out city map at the end of the program). The nearest bus stop is "Aachen Bushof". From Pontstraße, you can use the line 4.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Social Events
EXCURSIONS

WEDNESDAY, AUGUST 28, 2013 | 17:30

We offer four different excursions:

1) Bus trip to Jülich Supercomputing Centre

Meeting Point 1: Bus parking spot behind the Theater (Theaterstraße) | 17:30

Jülich Supercomputing Centre, at Forschungszentrum Jülich, located about 30km north-east of Aachen, currently hosts the most powerful supercomputer of Europe, a 458,752 core IBM BlueGene/Q system. Get an expert tour of the supercomputer and its surrounding facilities like a 12m-wide 3D visualization theater.

The tour is offered in English, includes a bus transfer to/from Jülich (about 45min each), and will take about 90 minutes. Food and drinks will also be provided.

2) A guided tour of the Cathedral of Aachen

Meeting Point 2: "Dom-Information", opposite to the "Schatzkammer" (Johannes-Paul-II-Str.) | 17:30

The Cathedral of Aachen was the first German World Heritage Site. The core of this building is more than 1200 years old. The former Palace Chapel of Charlemagne has developed into one of the most interesting cathedrals of Western Europe. Coronation church of German kings, burial site of Charlemagne and major pilgrimage church – the Cathedral


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of Aachen is a “must” for anyone who loves historic buildings and churches.

The tour is offered in English and will take about 45 minutes.

3) City tour of Aachen

Meeting Point 3: aachen tourist service at “Elisenbrunnen” (Friedrich-Wilhelm-Platz) | 17:30

The historic old town of Aachen invites to go for a stroll. Let yourself be guided through narrow alleys and across historic squares through the 2000 year-old history of Aachen. Experience all facets of Aachen, a modern city with beautiful historic town houses, many old and new fountains and innumerable stories all about the Cathedral and the Town Hall.

The city tour is offered in English and will take about 90 minutes.


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4) aixCAVE virtual-reality environment

Meeting Point 4: in front of the main entrance of the Computing Center (Kopernikusstraße 6) | 17:30

The aixCAVE is a five-sided immersive virtual reality environment at the Center for Computing and Communication of RWTH Aachen University. It has been constructed and installed in August 2012 by Barco N.V. in collaboration with the Virtual Reality Group. With a size of more than 5 m x 5 m for the rear floor projection, the system is not only the largest one worldwide, but raises the standards with respect to projection quality: by a sophisticated combination of high resolution, high brightness, brightness uniformity, specially coated screens, elaborate mechanical construction, and active stereo technology, a high level of immersion and an illusion of presence are achieved.

The aixCAVE is profitably and extensively used by numerous RWTH institutes and cooperation partners from academia and industry.

The tour is offered in English and will take about 30 minutes.


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Lunch

With your registration documents you will receive lunch tickets. Each ticket is worth up to 20 € and is valid on the day listed on the ticket. The tickets can be redeemed in a number of restaurants which are listed on the fold-out city map at the end of the program. The redemption procedure works as follows:

You order your lunch. Please inform the waitress/waiter that you will redeem an Euro-Par lunch ticket and show your badge.

After lunch you ask to redeem the ticket. The waitress / waiter will bring a receipt. In case the receipt is smaller or equal to 20 €, you just need to sign the bill. In case it is above 20 € you need to pay the difference and to sign the receipt. If you are in a group of Euro-Par attendees you can ask for a collective receipt. The sum of the receipt must not exceed the number of attendees times 20 €; every attendee needs to hand in the lunch ticket but only one needs to sign the receipt.

Tips are not included in the lunch ticket. You are not obliged to give a tip.


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Excursions

1 **MEETING POINT 1**
Bus Trip to Jülich

2 **MEETING POINT 2**
Tour Cathedral Aachen

3 **MEETING POINT 3**
City Tour Aachen
(aachen tourist service e.v.)

4 **MEETING POINT 4**
aixCAVE

Lunch Restaurants

01 Cuba Burger
Judengasse 10
>> Large varity of burgers

02 Oishi
Pontstraße 83
Phone +49 241 900 8360
>> Sushi and more

03 Orient Expresso
Templergraben 46
Phone +49 241 37 997
>> Turkish restaurant

04 Molkerei
Pontstraße 141
Phone +49 241 48 982
>> Versatile menu

05 Wrap Man
Pontstraße 178-180
Phone +49 241 40 10 72 40
>> Large variety of wraps

06 Goldener Schwan
Markt 37
Phone +49 241 31 649
>> German specialties. One of the oldest restaurants in town.

07 Lara
Mies van der Rohe Straße 10
Phone +49 241 9978 5505
>> International cuisine

08 Ratskeller/Postwagen
Markt 40
Phone +49 241 35 001
>> Exquisite cuisine in historic building

09 Pontgarten
Pontstraße 154
Phone +49 241 200 96
>> Turkish cuisine

10 GALILEI
Marienbongard 24-26
Phone +49 241 408 030
>> Special lunch menus

11 Café Extrablatt
Markt 45-47
Phone +49 241 400 2447
>> International cuisine

12 Elisenbrunnen
Friedrich-Wilhelm-Platz 14
Phone +49 241 9431 3490
>> Classic but modern interpretations of German specialties

13 Paella
Kockerellstraße 22
Phone +49 241 4010 757
>> Spanish cuisine

14 Rose am Dom
Fischmarkt 1 | Kleiner Münsterplatz
Phone +49 241 28782
>> Seasonal specials

15 Tijuana
Markt 45 – 47
Phone +49 241 401 9437
>> Mexican restaurant

16 Kaiserwetter
Hof 5
Phone +49 241 9437 9950
>> Mediterranean specialities

17 Pizzeria La Finestra
Pontstraße 123
Phone +49 241 25 845
>> Italian cuisine

18 Bar 'n' Burger
Templergraben 20
Phone +49 241 66 669
>> Burgeria

19 Magellan
Pontstraße 78
Phone +49 241 4016 440
>> International and Turkish cuisine

20 White House
Pontstraße 141- 149
Phone +49 241 4004 7661
>> International cuisine

Thanks to our sponsors





More information
www.europar2013.org