INTERNATIONAL EUROPEAN CONFERENCE ON PARALLEL AND DISTRIBUTED COMPUTING

25th ANNIVERSARY

EURO-PAR 2019

Celebrating the 25th Anniversary in Göttingen

August 26 – 30, 2019

Göttingen, Germany

HOSTED BY

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

GWDG
Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen

SUB | NIEDERSÄCHSISCHE STAATS- UND UNIVERSITÄTSBIBLIOTHEK GÖTTINGEN

EURO-PAR CONFERENCE 2019

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CONFERENCE 2019

Ramin Yahyapour (Ed.)

Euro-Par 2019

25. International European Conference on Parallel and Distributed Computing

Celebrating the 25th Anniversary in Göttingen

Göttingen 2019

Dear Steering Committee of Euro-Par,
dear Guests,

I am delighted to welcome you on behalf of the University of Göttingen. First, I would like to congratulate you on your 25th anniversary. The Euro-Par conference series has made a valuable contribution to the international visibility of high-performance computing in Europe. For 25 years now, the conference series has each time also put a European city and its contribution to the research community in the areas of parallel and distributed computing in the limelight, thus enabling an intensive networking of local and international researchers.

The University of Göttingen greatly appreciates this approach. Since its inauguration in 1737, the University has maintained international networks. At that time, the flourishing Georgia Augusta quickly attracted students from all over Germany, Europe and other continents to Göttingen. Since the founding days, international scholars have always been welcome guests in Göttingen, for example Benjamin Franklin and a number of others. On many house fronts in the historic city centre, you can discover signs with names of the researchers who lived there. We hope that this historical flashback will show you that Göttingen as a research location is looking forward to further intensifying international networking activities in the field of supercomputing.

I wish you a successful, inspiring conference in the historic buildings of the University of Göttingen, whose charm and atmosphere will allow you to experience the very special Göttingen spirit up close.

Prof. Dr. Dr. h.c. Ulrike Beisiegel
President of the Georg-August-Universität Göttingen

GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

Dear Friends,
Dear Euro-Par Community,

First of all: Welcome to Göttingen. I am pleased and honoured that Euro-Par 2019 takes place in our city of science. We do not only have an excellent scientific programme but also celebrate the 25th anniversary of Euro-Par, which makes this a very special event.

I have been personally committed to Euro-Par for many years and know how much personal enthusiasm the Chairs and Steering Committee bring to the conferences. Euro-Par lives from this dedicated work of like-minded people and friends to proliferate parallel and distributed computing. It is inspiring to see the creation of synergies and joint research in this research field. Euro-Par offers a perfect space to meet people working in fundamental research, application developers, companies, distinguished researchers as well as students who are making their first steps into the research community. There is open discussion and constructive collaboration. We always meet at eye level. And this is precisely the climate that creates conditions for innovation to grow. That is why so many have remained loyal to Euro-Par – in some cases for decades. A quarter of a century is a major achievement in a world of shifting priorities and new conferences and journals to appear every year. Euro-Par remained a key venue to present research in our domain. 25 years is also the opportunity to look back on the history of Euro-Par and discuss the future of our research. I am particularly pleased that the "founding fathers" and "living legends" from Euro-Par's hall of fame are taking part in the anniversary conference.

The vitality of Euro-Par is another driving force. The statutes expressly state that every Euro-Par organiser has a great deal of creative freedom. Of course, traditions have established themselves in recent years and some topics are classics that are on the agenda every year, but every organiser is free to contribute his or her own ideas. As director of GWDG, a computing centre offering HPC services to its researchers, it was obvious that we further wanted to bridge the gap between theory and practice. High-performance computing is becoming more relevant to a larger audience, while at the same time technology is becoming more complex to master. I encounter at University of Göttingen, that there is an increasing need to provide solutions to the users of HPC. I would be delighted if Euro-Par 2019 could promote the international collaboration of user groups and the parallel and distributed computing community and Euro-Par.

Of course, I also would like to thank all contributors who help to make the 25th edition of Euro-Par a worthy entry to the conference series. Especially, I would like to thank the organization committee from GWDG and SUB for their support. Similarly, I would like to extend my gratitude to the Steering Committee who provided guidance to recreate the Euro-Par spirit.

Now, I wish all of us a successful conference and many new impulses for our further work.

Enjoy your stay in Göttingen.

Sincerely,
Ramin Yahyapour

GWDG
Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen

Dear EURO-PAR community,

I would like to welcome you, also on behalf of the management of the SUB Göttingen, to this year's EURO-PAR conference here in Göttingen.

I am very pleased that the anniversary event can be hosted here on the Göttingen Campus. At this point, I would like to express my best wishes to EURO-PAR for its 25th anniversary. This is especially true of the long-standing active, but also the newly added organizations and people who have already contributed to the great success of previous conferences.

For the SUB Göttingen as a modern and service-oriented library, which constantly develops their offers, it is important to build their services on current and future-oriented technologies. Here, developments are also being determined together with the GWDG, which are anchored in the field of parallel and distributed computing. Therefore, I am pleased to see that such a broad and large community has dedicated itself to these topics over the many years and that new practical topics are also included in the conference programs.

A conference of importance and size like the EURO-PAR needs a lot of time and energy for preparation and follow-up, both organizational and scientific. Therefore I would like to thank the organizing committee of the GWDG and SUB as well as the Steering Committee.

Last but not least, I would like to thank all Chairs and participants for coming, their contribution and their already active participation in the two workshop days.

I wish you and all of us a successful and inspiring conference with a few nice days in Göttingen.

Frank Klaproth

To my person

Frank Klaproth is the Head of Department Digital Library at the State and University Library Göttingen. He is also an active member of the Campus-IT Gö* group and a member of the eResearch Alliance steering board, both bodies for planing and enhancing IT based services primarily for the Göttingen campus.

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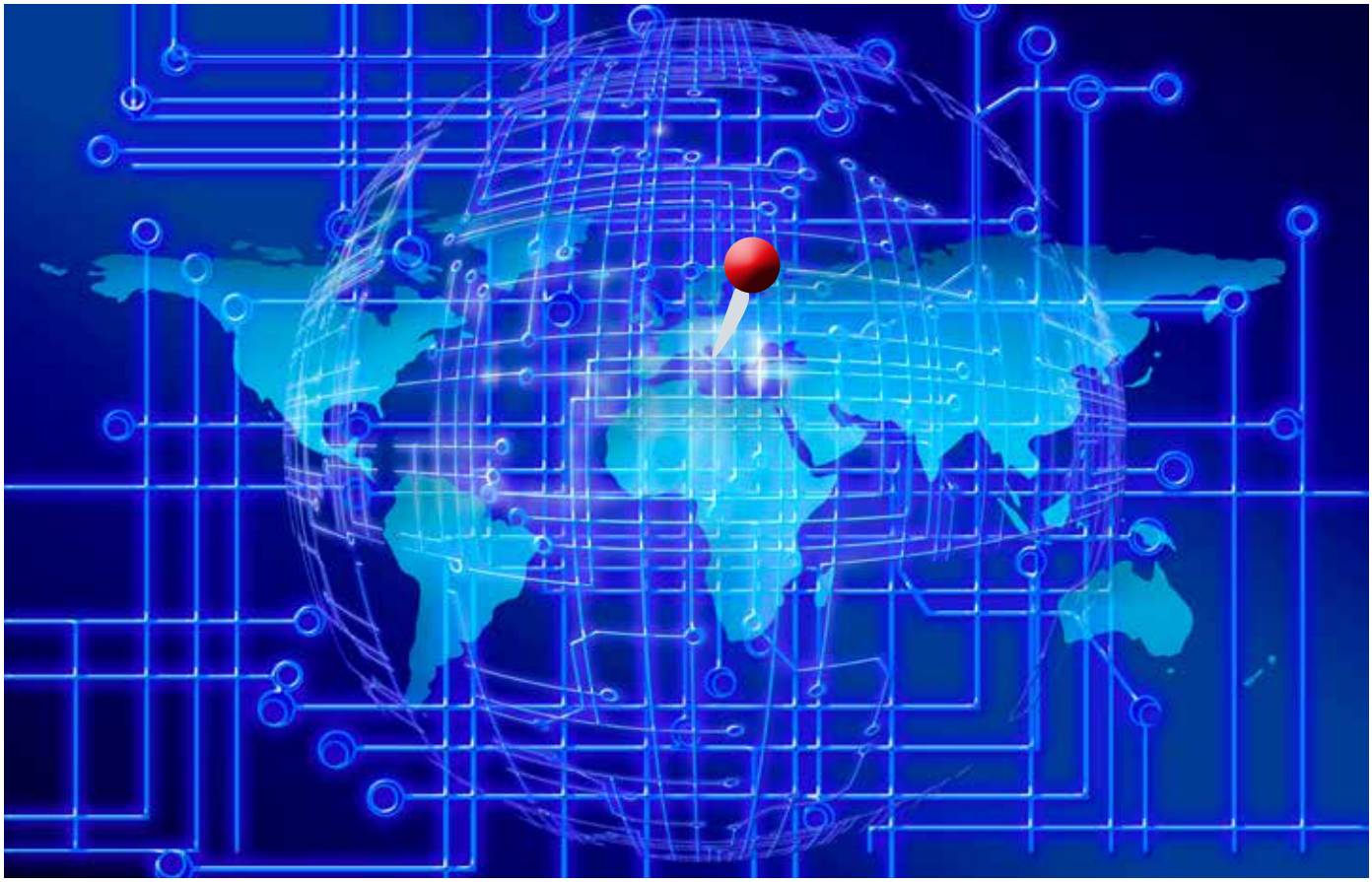


Dear Steering Committee of the Euro-Par,
Dear Euro-Par Team 2019,
Dear Conference Participants.

On behalf of the Partnership for Advanced Computing in Europe, I would hereby like to congratulate the Euro-Par conference – and the team behind it – on the 25th anniversary of the event. Covering all aspects of parallel and distributed processing, the Euro-Par conference has continuously helped to develop the use of High Performance Computing in Europe and beyond. Providing a forum for interaction within the HPC eco-system for so many years consecutively is both a goal and an achievement in one.

I wish you a memorable conference in Göttingen.

Serge Bogaerts, PRACE Managing Director



Dear EuroPar Community,
Dear Reader,

It is a pleasure to look back on the last 25 years on concurrent and parallel processing and to note that Euro-Par has established itself as the most important European conference in the field of scientific parallel processing. This conference series has contributed significantly to the development of scientific parallel processing, algorithms and methods, as well as qualification of young scientists in Europe. Since the first conference in Stockholm, hundreds of scientists and researchers have developed a variety of approaches and solutions in the areas of parallel programming and processing, parallel architectures and applications for the societal challenges of yesterday and today. Euro-Par has continuously evolved with current topics, questions, and technologies such as mobile and cloud computing.

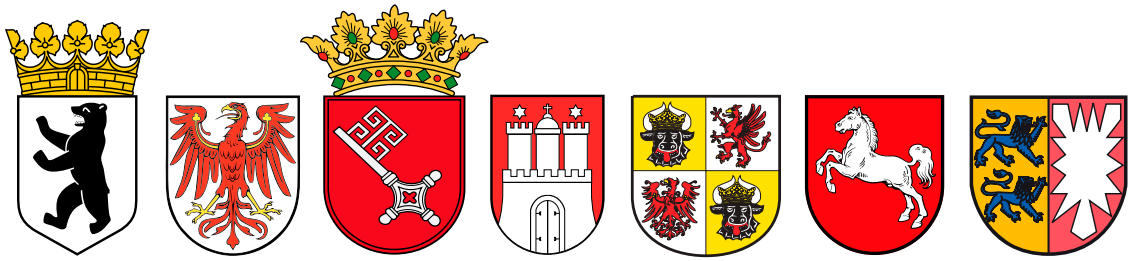
The members of the Gauß-Allianz – the scientific Tier-1, Tier-2 and Tier-3 HPC centres in Germany – provide supercomputing resources, trainings and consultation for the scientific community in Germany and Europe. With their methodological expertise, they contribute significantly to the efficient use of supercomputing resources and thus enable the solution of important societal challenges.

The Gauß-Allianz and its members wish Euro-Par all the best for its 25th anniversary, that it will continue to form a unique platform for the international scientific community in parallel and distributed processing in classical as well as in newly emerging fields and contribute to securing European software expertise. In addition to the qualification of young scientists, technology transfer in industry and business must also continue to be promoted. Only with sustainable and maintainable software solutions, the future challenges of parallel processing in the areas of exascale, cloud computing, big data and artificial intelligence can be jointly solved.

With best regards,

Prof. Dr. Wolfgang E. Nagel
Prof. Dr. Thomas Ludwig
Prof. Dr.-Ing. Dr. h.c. Dr. h.c. Prof. E.h.
Michael M. Resch
(Board of Directors of the Gauß-Allianz e. V.)

GA Gauß-Allianz




Kiel
Rostock
Bremerhaven
Hamburg
Bremen
Hannover
Berlin
Potsdam
Göttingen
Cottbus

Dear Euro-Par Steering Committee,
dear Conference Participants,

the Euro-Par 2019 conference in Göttingen/Germany occurs for the 25th time. Euro-Par has always been an important and exciting event for the international community of high performance computing. This time period was characterized by a growing degree of complexity and parallelism in computer hardware, software and algorithms as well as in related research areas.

Having served several times as a topic chair on newly emerging research fields such as “Meta-Computing”, “Grid Computing”, and “Cluster Computing”, I had the privilege to witness the successful evolution of the Euro-Par Conference over the past decades. Indeed, the quick adaptation to newly emerging research topics is probably one of the biggest assets of Euro-Par compared to other conferences.

On behalf of Zuse Institute Berlin (ZIB) and the North German Supercomupting Alliance (HLRN) I wish the Euro-Par conference series a bright future in the coming decades and the participants of Euro-Par 2019 a memorable event in Göttingen.

Alexander Reinefeld

ZUSE INSTITUTE BERLIN

HLRN

SPOTLIGHT ON THE EURO-PAR

Since 1995 Euro-Par, an annual series of international conferences has been established as one of the most important High Performance Computing Conferences dedicated to the promotion and advancement of all aspects of parallel and distributed computing.

Euro-Par's objective is to be the primary choice of such professionals for the presentation of new results in their specific areas. As a wide-spectrum conference, Euro-Par fosters the synergy of different topics in parallel and distributed computing.

Euro-Par covers a wide spectrum of topics from algorithms and theory to software technology and hardware-related issues, with application areas ranging from scientific to mobile and cloud computing. Covered are all aspects of parallel and distributed processing, ranging from theory to practice, from small to the largest parallel and distributed systems and infrastructures, from fundamental computational problems to full-fledged applications, from architecture, compiler, language and interface design and implementation, to tools, support infrastructures, and application performance aspects. Of special interest are applications which demonstrate the effectiveness of the main Euro-Par topics.

Euro-Par's unique organization into topics provides an excellent forum for focused technical discussion, as well as interaction with a large, broad and diverse audience.

Euro-Par provides a forum for the introduction, presentation and discussion of the latest scientific and technical advances, extending the frontier of both the state of the art and the state of the practice.

The main audience of Euro-Par are the researchers in academic institutions, government laboratories and industrial organisations.

In addition, Euro-Par conferences provide a platform for a number of accompanying, technical workshops. Thus, smaller and emerging communities can meet and develop more focussed topics or as yet less established topics.

The unique organizational structure of a Euro-Par conference, which puts the hosting team in charge of both the scientific programme and the local organization, makes it a particularly lively and stimulating experience.

THE STEERING COMMITTEE OF THE EURO-PAR

Chairs

Luc Bougé (Chair), ENS Rennes, France;
Fernando Silva (Vice-Chair), University of Porto, Portugal

Members

Marco Aldinucci, University of Turin, Italy;
Dora Blanco Heras (Workshops Chair), CiTIUS, Santiago de Compostela, Spain;
Emmanuel Jeannotm LaBRI-INRIA, Bordeaux, France;
Christos Kaklamanis, Computer Technology Institute, Patras, Greece;
Paul Kelly, Imperial College, London, United Kingdom;
Thomas Ludwig, University of Hamburg, Germany;
Tomàs Margalef, University Autonoma of Barcelona, Spain;
Wolfgang Nagel, Dresden University of Technology, Germany;
Francisco Fernández Rivera, CiTIUS, Santiago de Compostela, Spain;
Rizos Sakellariou, University of Manchester, United Kingdom;
Henk Sips, Delft University of Technology, The Netherlands;
Domenico Talia, University of Calabria, Italy;
Jesper Larsson Träff, TU Vienna, Austria;
Denis Trystram, Grenoble Institute of Technology, France;
Felix Wolf, TU Darmstadt, Germany

Honorary members

Christian Lengauer, University of Passau, Germany;
Ron Perrott, Oxford e-Research Centre, United Kingdom;
Karl Dieter Reinartz, University of Erlangen-Nürnberg, Germany

Oberservers

Ramin Yahyapour, GWDG / University of Göttingen, Germany;
Krzysztof Rzadca, University of Warsaw, Poland

The Steering Committee at Euro-Par 2017


Euro-Par
2013
Aachen
Euro-Par European Conference on Parallel Computing
August 26-30, 2013 | Aachen, Germany
Key dates
Abstracts due January 31
Full papers due February 7
Workshop proposals due February 28
Author notification May 8
Camera-ready full papers due June 1
Conference August 26-30
Topics
1 Support Tools and Environments
2 Performance Prediction and Evaluat
3 Scheduling and Load Balancing
4 High-Performance Architectures a
5 Parallel and Distributed Data Man
6 Grid, Cluster and Cloud Computin
7 Peer-to-Peer Computing
8 Distributed Systems and Algorith
9 Parallel and Distributed Program
10 Parallel Numerical Algorithms
11 Multicore and Manycore Prograr
12 Theory and Algorithms for Paral
13 High-Performance Networks an
14 High-Performance and Scientifi
15 GPU and Accelerator Computin
16 Extreme-Scale Computing
Conference workshops
Euro-Par 2013 will feature a series of satellite workshops on August 26-27. Proposals for workshops covering a specific theme and lasting between half a day and a full day are encouraged and solicited until February 28, 2013.
Organization Felix Wolf | Dieter an Mey | Bernd Mohr | Vera Kleber
More information
www.europar2013.org
JÜLICH
RWTH AACHEN UNIVERSITY


Euro-Par 2008
Route 2
Euro-Par 2008
Route 1
Euro-Par 2008
Las Palmas de Gran Canaria
August 26-29th, 2008

Euro-Par 2006
Dresden, Germany

29th August - 1st September 2006

European Conference on Parallel Computing

CALL FOR PAPERS

General

Euro-Par is an annual series of international conferences dedicated to the promotion and advancement of all aspects of parallel computing. The major themes can be divided into the broad categories of hardware, software, algorithms, and applications for parallel computing. The objective of Euro-Par is to provide a forum within which to promote the development of parallel computing as an industrial technique and as an academic discipline, extending the frontier of both the state of the art and the state of the practice.

Venue

Technische Universität Dresden is one of the oldest technical universities in Germany and has a long tradition of designing and building measuring instruments, mechanical calculators, and pioneering computers. Currently, it is installing one of the largest high performance computing facilities for data intensive computing in Germany.

The city of Dresden will celebrate its 800th anniversary in 2006. Furthermore, Dresden has been elected "City of Science" in Germany for the year 2006.

Scientific Program and Workshops

The following topics will be covered by regular Euro-Par 2006 sessions:

1. Support Tools and Environments
2. Performance Prediction and Evaluation
3. Scheduling and Load Balancing
4. Compilers for High Performance
5. Parallel and Distributed Databases, Data Mining and Knowledge Discovery
6. Grid and Cluster Computing: Models, Middleware and Architectures
7. Parallel Computer Architecture and Instruction Level Parallelism
8. Distributed Systems and Algorithms
9. Parallel Programming: Models, Methods, and Languages
10. Parallel Numerical Algorithms
11. Distributed and High-Performance Multimedia
12. Theory and Algorithms for Parallel Computation
13. Routing and Communication in Interconnection Networks
14. Mobile and Ubiquitous Computing
15. Peer-to-Peer and Web Computing
16. Applications of High-Performance and Grid Computing
17. High Performance Bioinformatics
18. Embedded Parallel Systems

BRIEF HISTORICAL OVERVIEW – BACK IN TIME

25. Euro-Par, 2019
University of Göttingen / GWDG, Göttingen, Germany
Ramin Yahyapour, CIO University of Göttingen / GWDG, Göttingen, Germany;
Ulrich Schwardmann, GWDG, Göttingen, Germany;
Christian Boehme, GWDG, Göttingen, Germany

24. Euro-Par, 2018
University of Turin, Italy
Marco Aldinucci, University of Torino, Italy;
Luca Padovani, University of Torino, Italy;
Massimo Torquati, University of Pisa, Italy

23. Euro-Par, 2017
University of Santiago de Compostela, Spain
Francisco F. Rivera, University of Santiago de Compostela, Spain;
Tomás F. Pena, University of Santiago de Compostela, Spain;
José C. Cabaleiro, University of Santiago de Compostela, Spain

22.Euro-Par, 2016
Grenoble Institute of Technology, France
Pierre-François Dutot, Université Grenoble Alpes Grenoble, France;
Denis Trystram, Université Grenoble Alpes Grenoble, France

21. Euro-Par, 2015
Vienna University of Technology, Austria
Jesper Larsson Träff, Vienna University of Technology, Austria;
Sascha Hunold, Vienna University of Technology, Austria;
Francesco Versaci, Vienna University of Technology, Austria

20. Euro-Par, 2014
University of Porto, Porto, Portugal
Fernando Silva, Universidade do Porto, Portugal;
Inês Dutra, Universidade do Porto, Portugal;
Vítor Santos Costa, Universidade do Porto, Portugal

19. Euro-Par, 2013
German Research School for Simulation Sciences, Forschungszentrum Jülich and RWTH Aachen University, Germany
Felix Wolf, RWTH Aachen University and German Research School for Simulation Sciences GmbH, Aachen, Germany;
Bernd Mohr, Jülich Supercomputing Centre, Germany;
Dieter an Mey, RWTH Aachen University, Germany

18. Euro-Par, 2012
CTI, Rhodes, Greece
Christos Kaklamanis, University of Patras, Greece;
Theodore Papatheodorou, University of Patras, Greece;
Paul G. Spirakis, University of Patras, Greece

17. Euro-Par, 2011
LaBRI-INRIA, Bordeaux, France
Emmanuel Jeannot, INRIA, Bordeaux, France;
Raymond Namyst, Université de Bordeaux, INRIA, France;
Jean Roman, Université de Bordeaux, INRIA 351, France

16. Euro-Par, 2010
ICAR-CNR, Ischia, Italy
Pasqua D'Ambra, ICAR-CNR, Napoli, Italy;
Mario Guarracino, ICAR-CNR, Napoli, Italy;
Domenico Talia ICAR-CNR, Rende, Italy

15. Euro-Par, 2009
Delft University of Technology, Delft, The Netherlands
Henk Sips, Delft University of Technology, The Netherlands;
Dick Epema, Delft University of Technology, The Netherlands;
Hai-Xiang Lin, Delft University of Technology, The Netherlands

14. Euro-Par, 2008
University of Las Palmas, Gran Canaria, Spain
Emilio Luque, Universidad Autónoma de Barcelona (UAB), Spain;
Tomàs Margalef, Universidad Autónoma de Barcelona (UAB), Spain;
Domingo Benítez, Universidad de Las Palmas de Gran Canaria, Spain

13. Euro-Par, 2007
IRISA/ENS Cachan, Rennes, France

Anne-Marie KermarrIRISA/INRIA, Rennes Cedex, France;
Luc Bougé, IRISA/ENS Cachan, Rennes Cedex, France;
Thierry Priol, IRISA/INRIA, Rennes Cedex, France

12. Euro-Par, 2006

Dresden University of Technology, Dresden, Germany
Wolfgang E. Nagel, TU Dresden, Zentrum für Informationsdienste und Hochleistungsrechnen, Institut für Technische Informatik, Germany;
Wolfgang V. Walter, TU Dresden, Institut für Wissenschaftliches Rechnen, Germany;
Wolfgang Lehner, TU Dresden, Institut für Systemarchitektur, Germany

11. Euro-Par, 2005

New University of Lisbon, Lisbon, Portugal
José C. Cunha, Universidade Nova de Lisboa, Caparica, Portugal;
Pedro D. Medeiros, Universidade Nova de Lisboa, Caparica, Portugal

10. Euro-Par, 2004

University of Pisa, Pisa, Italy
Marco Danelutto, Marco Vanneschi, University of Pisa, Italy;
Domenico Laforenza, High Performance Computing Laboratory, Pisa, Italy

9. Euro-Par, 2003

University of Klagenfurt, Klagenfurt, Austria
Harald Kosch, University Klagenfurt, Austria;
László Böszörményi, University Klagenfurt, Austria;
Hermann Hellwagner, University Klagenfurt, Austria

8. Euro-Par, 2002

University of Paderborn, Paderborn, Germany
Burkhard Monien, Universität Paderborn, Germany;
Rainer Feldmann, Universität Paderborn, Germany; Universität Paderborn

7. Euro-Par, 2001

University of Manchester / Manchester Visualization Centre, Manchester, UK
Rizos Sakellariou, University of Manchester, U.K.;
John Gurd, University of Manchester, U.K.;
Len Freeman, University of Manchester, U.K.;
John Keane, UMIST, Department of Computation, Manchester, U.K.

6. Euro-Par, 2000

Technical University of Munich, Munich, Germany
Arndt Bode, Technische Universität München, Germany;
Thomas Ludwig, Technische Universität München, Germany;
Wolfgang Karl, Technische Universität München, Germany;
Roland Wismüller, Technische Universität München, Germany

5. Euro-Par, 1999

CERFACS / ENSEEIGHT-IRIT, Toulouse, France
Patrick Amestoy, ENSEEIHT, Toulouse Cedex 7, France;
Philippe Berger, ENSEEIHT, Toulouse Cedex 7, France;
Michel Dayde, ENSEEIHT, Toulouse Cedex 7, France;
Daniel Ruiz, ENSEEIHT, Toulouse Cedex 7, France;
Iain Duff, CERFACS, Toulouse Cedex 1, France;
Vale rie Fraysse, Toulouse Cedex 1, France;
Luc Giraud, Toulouse Cedex 1, France

4. Euro-Par, 1998

University of Southampton, Southampton, UK
David Pritchard, University of Southampton, UK;
Jeff Reeve, University of Southampton, UK

3. Euro-Par, 1997

University of Passau, Passau, Germany
Christian Lengauer, Universität Passau, Germany;
Martin Griebl, Universität Passau, Germany;
Sergei Gorlatch, Universität Passau, Germany

2. Euro-Par, 1996

Ecole Normale Supérieure de Lyon, Lyon, France
Luc Bougé, École Normale Supérieure de Lyon, Lyon Cedex 07, France:
Pierre Fraigniaud, École Normale Supérieure de Lyon, Lyon Cedex 07, France;
Anne Mignotte, École Normale Supérieure de Lyon, Lyon Cedex 07, France;
Yves Robert, École Normale Supérieure de Lyon, Lyon Cedex 07, France

1. Euro-Par, 1995

SICS and KTH, Stockholm, Sweden
Seif Haridi, SICS (Swedish Institute of Computer Science), Kista, Sweden;
Khayri Ali, SICS (Swedish Institute of Computer Science), Kista, Sweden;
Peter Magnusson, SICS (Swedish Institute of Computer Science), Kista, Sweden

1. Euro-Par, 1995
SICS and KTH, Stockholm, Sweden

2. Euro-Par, 1996
Ecole Normale Supérieure de Lyon, France

3. Euro-Par, 1997
University of Passau, Germany

4. Euro-Par, 1998
University of Southampton, UK

5. Euro-Par, 1999
CERFACS / ENSEEIGHT-IRIT, Toulouse, France

6. Euro-Par, 2000
Technical University of Munich, Germany

7. Euro-Par, 2001
University of Manchester / Manchester Visualization Centre, UK

8. Euro-Par, 2002
University of Paderborn, Germany

9. Euro-Par, 2003
University of Klagenfurt, Austria

10. Euro-Par, 2004
University of Pisa, Italy

11. Euro-Par, 2005
New University of Lisbon, Portugal

12. Euro-Par, 2006
Dresden University of Technology, Germany

13. Euro-Par, 2007
IRISA/ENS Cachan, Rennes, France

14. Euro-Par, 2008
University of Las Palmas, Gran Canaria, Spain

15. Euro-Par, 2009
Delft University of Technology, Delft, The Netherlands

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ICAR-CNR, Ischia, Italy

17. Euro-Par, 2011
LaBRI-INRIA, Bordeaux, France

18. Euro-Par, 2012
CTI, Rhodes, Greece

19. Euro-Par, 2013
German Research School for Simulation Sciences, Forschungszentrum Jülich and RWTH Aachen University, Germany

20. Euro-Par, 2014
University of Porto, Portugal

21. Euro-Par, 2015
Vienna University of Technology, Austria

22.Euro-Par, 2016
Grenoble Institute of Technology, France

23. Euro-Par, 2017
University of Santiago de Compostela, Spain

24. Euro-Par, 2018
University of Turin, Italy


Lecture Notes in Computer Science 966
EURO-PAR '95 Parallel Processing
Lecture Notes in Computer Science 1123
Euro-Par'96 Parallel Processing
Lecture Notes in Computer Science 1300
Euro-Par'97 Parallel Processing
Lecture Notes in Computer Science 1470
David Pritchard Jeff Reeve (Eds.)
Euro-Par'98 Parallel Processing
Lecture Notes in Computer Science 1685
Euro-Par'99 Parallel Processing
Lecture Notes in Computer Science 1900
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LNCS 6852
Euro-Par 2011 Parallel Processing
LNCS 7484
Euro-Par 2012 Parallel Processing
ARCoSS
LNCS 8097
Felix Wolf
Bernd Mohr
Dieter an Mey (Eds.)
Euro-Par 2013 Parallel Processing
LNCS 8632
Fernando Silva Inês Dutra
Vítor Santos Costa (Eds.)
Euro-Par 2014 Parallel Processing
LNCS 9233
Jesper Larsson Träff
Sascha Hunold
Francesco Versaci (Eds.)
Euro-Par 2015: Parallel Processing
LNCS 9833
Pierre-François Dutot
Denis Trystram (Eds.)
Euro-Par 2016: Parallel Processing
LNCS 10417
Francisco F. Rivera
Tomás F. Pena
José C. Cabaleiro (Eds.)
Euro-Par 2017: Parallel Processing
LNCS 11014
Marco Aldinucci
Luca Padovani
Massimo Torquati (Eds.)
Euro-Par 2018: Parallel Processing
Springer

RETROSPECT OF THE STEERING COMMITTEE ON 25 SUCCESSFUL YEARS OF THE EURO-PAR CONFERENCE SERIES

The Birth of Euro-Par

Ron Perrott
Oxford e-Research Centre, United Kingdom

The 80s saw the expansion of the number of computing conferences in Europe as computer science became a well-established research topic and subject in universities across Europe. As a result many of these conferences had similar topics and objectives. In particular three of the conferences, CONPAR, VAPP and PARLE, had parallelism as a theme and saw the opportunity to create one larger European conference which would act as a reporting forum for European parallel activity and be on a par with conferences in the area around the world. Members of the three Steering Committees agreed to meet in Munich and discuss the possibility of merging their activities into one larger entity. There was substantial goodwill among the participants and as a result the discussions were successful and hence Euro-Par was born. It was agreed that 1995 would be the merger year and Stockholm was selected as the location.

1995 (Stockholm)

This first conference had a very different structure than current Euro-Par conferences – there were no topics or workshops – it was a 'traditional' conference in that there was a single structure. The conference in Stockholm was highly successful and led to establishment of Euro-Par on the European conference.

Editor's note: EURO-PAR '95 conference was organized by the Swedish Institute of Computer Science (SICS) and the Department of Teleinformatics at KTH. The Conference Proceedings contain 50 full revised research papers and 11 posters selected from a total of 196 submissions on the basis of 582 reviews.

Ron Perrott and Christian Lengauer, 2008

Impressions of over two Decades of Euro-Par

Christian Lengauer
University of Passau

I had the good fortune of attending every Euro-Par that was held in the topics format, i.e., starting from 1996. Here are a few personal and, admittedly, spotty if not myopic impressions.

1996 (Lyon)

This was an exciting event with over 300 participants (after the concerning 130 participants of the previous launch year) and with two-volume proceedings. Everybody had wondered whether the drastic switch to the topic format would be successful. High point of the week was a banquet at a location outside the city, to which we were transported in three buses. One memory is seeing the leading bus turning around on a narrow mountain road and coming back against the other two after it had got lost. We were half an hour late, hungry and relieved. It turned into a marvelous evening.

1997 (Passau):

This was my own chance to host 330 Euro-Par delegates at my home university in a city that was a catholic center in Europe a thousand years ago. One thing that sticks in my mind is how the university

responded by sprucing up the campus with lawn mowing, etc. without me having asked for it. Also, the city was very appreciative: at the public organ concert in the cathedral (at the time, the largest church organ of the world), the best seats were reserved for the Euro-Par delegates. The banquet took place on the (then) new pride boat of Passau, the Regina Danubia. We departed with the sun setting and the Carillion of the town hall playing. Down river in the dark, some delegate rushed to me and said: "Look how dark it is. This must be a power outage!" I replied: "No, this is upper Austria."

1998 (Southampton):
This was a year of high hopes for Java, also for high-performance computing at Euro-Par. The Java Grande Forum founded two years later had some influence on the development of Java, but did not turn it into an HPC language for the masses. At the opening session, we learned quickly that a conference bag with a Velcro latch is not a good idea. The laughter mounted, as one after the other latecomers let it rip. As the culmination of the week I remember the banquet in the wonderful car museum. Academics were transformed into little children. The week was marred with very bad weather. When a few of us took a taxi in a heavy downpour, the driver asked our reason to come to Southampton. We explained that we were conference delegates. His reply: "What are you selling? Submarines?"

1999 (Toulouse):
I remember the array of first-rate invited speakers, particularly the side-splitting keynote by Tom Sterling, promoting serious supercomputing with components-off-the-shelf computers (at the time a ground-breaking concept) and a wonderful excursion in sunny, southern-French weather to the museum of Henri Toulouse-Lautrec.

2000 (Munich):
If you take attendance, this was the most successful event in Euro-Par history with over 400 delegates. The banquet was in the large Löwenbräukeller and typically Bavarian in food and entertainment. Getting there was nearly impossible since, at the time, another watershed thunderstorm erupted. But, eventually, we managed. At the end of the week, Ron Perrott gave up the SC chairmanship for my benefit, for which I am grateful to him to this day.

2001 (Manchester):
Our second Euro-Par in the United Kingdom in a short time, and the last to date. I remember the keynote of Ian Foster on the anatomy of the Grid. The banquet at the town hall was again unique. The invitation said to come smartly dressed. The major, a wonderful, jolly man, came in his afternoon attire (which I remember as very ornate). He stepped into the hall, looked over his guests most of whom came dressed in something like camping gear and remarked: "Oh, I think I am overdressed". After dinner, the highly acclaimed Manchester Boys Choir sang. They had come from Moscow that day, had stopped at a fast-food joint prior to their performance, and had seriously upset their tummies. They still insisted on performing for us.

2002 (Paderborn):
The unique attraction for Euro-Par delegates in Paderborn was the Heinz Nixdorf MuseumsForum that was also the site of the banquet. I felt experienced (or old?) wandering through it, since most the exhibits were from my living memory. I also felt grateful for having spent my professional life in such a fast-moving field.

2003 (Klagenfurt):
Our first time on Austria in a very pleasant city at the Wörthersee. The unique event of this year was a memorial panel and exhibition in the honor of three prominent computer scientists who had recently passed away: Ole-Johan Dahl, Edsger W. Dijkstra and Kristen Nygaard. Among the panelists were Tony Hoare, who also gave a keynote on verifying compilers, Niklaus Wirth and Bertrand Meyer. On the last day, the home-travelers were again hit by very serious storms that caused flight cancellations and serious conditions on the roads (apparently a recurring theme in the first decade of Euro-Par).

2004 (Pisa):
And on we went to Italy. At least to me, the graceful and elegant architecture in the Piazza di Miracoli was a lesson for equally graceful software and hardware architecture (including its fallacy, the leaning tower). This was the first year without short papers,

so-called research notes, which had been included in 1996 to increase attendance. It was also the last year of elections to the steering committee.

2005 (Lisbon):
This was the year of our first visit to Portugal. The Euro-Par site was the New University outside the city. In one of the keynotes, Jose Moreira covered the evolution of the Blue Gene/L Supercomputer. I remember the extreme dedication of the organizer, Jose Cunha, for our well-being. I also remember the absence of toilet seats at the conference site. The social high point was the banquet during a cruise on a large jet boat on the river Tagus on a wonderful summer evening.

2006 (Dresden):
The host of this conference, Wolfgang Nagel, had gourmet aspirations. They showed already at the reception in the hall of the new informatics building in Dresden, with jazz music, and later at the banquet at Schloß Albrechtsberg with view of the river Elbe and the center of Dresden. A historic event was a concert in the just reopened Frauenkirche, which had been rebuilt from scratch and, thus, was the only Baroque building in the world in mint condition.

2007 (Rennes):
Euro-Par was proud to have this conference organized by a very determined and, nevertheless, extremely charming lady: Anne-Marie Kermarrec. Luc Bouge advised and brought the colocated workshops on track in their first year. Of the conference events, I remember most the banquet at the Atlantic seashore with view of Mont St. Michel, an impressive sight indeed!

2008 (Las Palmas):
Euro-Par went to the very western fringes of Europe and still stayed in Euroland! The conference was organized in Barcelona but held on the Canaries. My hotel looked out on the central beach of Las Palmas and I found it strange to wake up at 7:30 a.m. and still see a flood-lit beach in the pitch-dark. The banquet was open-air at the seashore elsewhere on the island, and I remember surprising Ron Perrott with the award that was soon to be called the Euro-Par Achievement Award. I also remember, giving a newspaper interview (the only time that this happened) and not being able to read it in Spanish print the next day. But my most vivid memory is the fatal crash of Span Air flight 5022 in Madrid on the way to Gran Canaria – three days before I and other Euro-Par delegates took the same flight. Luckily, none of us had planned to fly three days earlier.

2009 (Delft):
The Netherlands hosted us in this wonderful, picturesque town. I remember my pleasant walks from the hotel to the technical university in the mornings and into the city in the evenings, and the banquet on an extended cruise through the harbour of Rotterdam (I love harbour cruises!), on which Paul Feautrier received his Achievement Award.

2010 (Ischia):
Our second island conference (after Las Palmas) brought us to a pool hotel with true holiday spirit – quite a novel atmosphere. The guestrooms were a stone throw from the conference rooms. Both were located next to the big pool. I remember feeding the many cats at lunch time that were graciously tolerated by the hotel staff and guests. And there was another singular event, at the banquet: dancing to live music!

2011 (Bordeaux):
I remember the majestic center of Bordeaux, which seemed to be populated with only stylish and beautiful people. Another stylish element was the (then fairly new) electric street cars without visible power lines. As they drove us out from the center to the conference site, they eventually entered an area with more rudimentary architecture and, at that point, extended cheekily an arm for the suddenly appearing overhead line. And I remember the seemingly dominating food items: duck and gingerbread.

2012 (Rhodes):
This time we went to the East fringes of Europe, in plain sight of Asian Turkey! This was a very difficult year for the organizing team. Greece was in economic turmoil at the time, which caused the hotel at which the conference was planned to fold in May. After contemplating a move to the mainland, a substitute was found nearby that turned out to be as good if not better – a holiday experience similar to Ischia two years prior! Then, on the day before the conference started, the chief host, Christos Kaklamanis, who had done a wonderful and meticulous

job in preparing the conference, suffered a serious emergency in his immediate family, which caused him to miss the entire week. I was amazed how his team managed to cover for him and keep up their and our spirits!

2013 (Aachen):
We were back to another ancient city in Germany and another Catholic center of Europe of a thousand years back, where Charlemagne was crowned in the year 800. While the conference building was brand-new and had just opened, the banquet was in the historic town hall from 1300, venue for the coronation banquets of kings. We were honored to have the city mayor participate. One successful experiment was the lunches: coupons were given out that were good at a number of different and interesting restaurants around the conference site.

2014 (Porto):
Back in Portugal, we explored the north of the country this time and were stunned by the sites of Porto that we could enjoy on a river cruise as well as from the terrace of Taylor Port Cellars at the banquet (with a tour of the cellars). Of that evening I remember most the extreme delight of Henri Bal about his Achievement Award. We were unlucky with the reception at a wonderful beach site two days earlier. One of the very few downpours of the year came on precisely that evening – the recurring theme of rain was back to haunt Euro-Par again, but it was sunny during the rest of the week.

2015 (Vienna):
I had looked very much forward to having Euro-Par in the city that has repeatedly been rated as most livable city of the world – and I was not to be disappointed. The central location put the city directly at our disposal, and the banquet at a classic Wiener Heuriger Wolff with live music was a cultural experience. Again, the delight of Mateo Valero about his Achievement Award is stuck in my mind. It pleased me especially in the awareness of how many awards he had received before. I had another cultural experience on my train ride back, crammed between hundreds of refugees that travelled the Balkan route at that time – mostly young men and mostly very cheerful. They all piled out at Passau station, where I left them behind when I was the one of the few the border posts let pass unchecked.

2016 (Grenoble):
The fourth time in France we went to another cliff site like Porto, with the banquet actually on the cliff (to be reached via a funicular whose frail looks made some people nervous). The unique experience there was a Tango dancing lesson happening on the plateau as we waited to be let into the dinner hall. Several elegantly moving professional dancers led on some seemingly deliriously happy women to seductive Latin music in view of a setting sun – wow! I also remember personal travel problems. My hotel bookings for the selection meeting and the conference week were both lost and the TGV that was supposed to get me back to Lyon for a flight to Munich decided not to do the planned stop at Lyon airport but barrel through the station at 300 km/h and go straight on to Paris. I spent 11 hours on the train to Munich rather than one hour on the plane!

2017 (Santiago de Compostela):
This Euro-Par brought me to a part of Spain that was completely different from the Spain I knew. The weather was different, the architecture was different, the food was different. The organizers had modified the Euro-Par logo on the poster, and I only realized the significance when I saw the logo of the city: the seashell. The banquet was in a truly historic place and, naturally, it made a lasting impression on me because I had just given up my SC chairmanship and was being celebrated by my colleagues. Ian Foster, who I had met and whose keynote I had enjoyed in 2001, came to receive his Achievement Award and was again most pleasant company. And the SC won with Dora Heras a new and refreshing force for the collocated workshops.

2018 (Turin):
Our latest Euro-Par put us in a truly historic center of Northern Italy, at a time for short four years even the capital of the entire country. My overriding memory of Turin will be one of arcades and imperial architecture filled with music, be it from the arcade of the opera house or from private musicians on the many wide-open squares.

THE EURO-PAR WORKSHOPS:

Looking back at the last 25 years

Luc Bougé
Chair of the Euro-Par Steering Committee
IRISA, ENS Rennes and INRIA Rennes, France

Dora Blanco Heras
Genreal Workshop Chair of Euro-Par
University of Santiago de Compostela, Spain

In 1996, the Euro-Par conference was designed as a set of co-located workshops. The driving vision was that each of the workshops was entrusted to a small committee, made of representative members of a specific scientific community. This committee was in charge of defining the workshop scope, writing the call for papers, selecting the submissions, organizing the program, chairing the sessions and doing their best to foster interactions between attendants. The Euro-Par organization was in charge of the global infrastructure: listing the invited scientific communities, identifying a workshop chair for each of them, and building up the overall technical, financial and commercial structure to host all the workshops.

In 1996, 22 workshops were launched. A number of them did not fly well for various reasons: some were cancelled, some were merged. Eventually, 15 workshops were actually proposed at the conference. It worked pretty well, and the next editions of the conference built up on this concept. In 1997, 16 workshops were presented, including one specifically dedicated to the Esprit European projects. But only 10 workshops were presented in 1998, with numerous merges. At that time it became clear that this concept of workshops did not work that well, in the sense that the participants were more interested in attending talks about scientific topics than in taking this opportunity to build up their specific scientific community.

Therefore, it was decided in 1999 to call the Workshops rather Topics, and this term has been used since. As many as 20 topics were presented in 1999, 21 in 2000, 19 in 2001, 16 in 2002, 19 in 2003, including a Demonstration topic, 19 in 2004, again with a Demo session, 16 in 2005 and 18 in 2006. The model became stable, and the list of topics started consolidating over the years, with a set of a dozen core topics, gathering a well-identified community, extended with a set of transient, additional topics specifically proposed in each year by the local organization team.

In those years, a tension grew regarding the scientific quality of the papers presented at the conference. On the one hand, it was necessary to accept many papers to attract a large number of attendants and make the event interesting and, on the other hand, the objective was to establish Euro-Par as a high-quality conference, the leading European conference for parallel and distributed computing. As soon as 1996, a distinction had been made between "regular papers", with a limit of 10 pages, and "short papers", also known as "research notes", with a limit of 4 pages. In 2000, for instance, the call for papers attracted 326 submissions of which 167 were accepted. Of the papers accepted, 5 were judged as distinguished (1.6%), 94 as regular (29%), and 68

as research notes (21%). Depending on the spread of papers included, the acceptance rate of the conference was either 30% or 50%, which makes the difference between a class A conference and a class B conference. Also, some authors did not make explicit in their publication lists that their papers had been accepted as a research note (best 50%), and not as a regular paper (best 30%). This risk of confusion led the steering committee to get rid of the short papers at the main conference, and to create a series of satellite Euro-Par workshops instead, to provide attendants with another venue for scientific interaction. It was decided to go for a model already developed by other conference for many years.

In the IPDPS model, the 5-day conference week is made up of several activities. The main one is the 3-day IPDPS conference. The remaining 2 days are allocated to the so-called IPDPS workshops. The IPDPS organization committee includes a Workshop Committee in charge of issuing a call to the community and selecting the proposed workshops. The proposition include a chair, a program committee, a description of the scientific domain at stake, and some principles about the technical organization of the call for papers, the selection, and the conduct of the event. The selected workshops commit to meet a common schedule and implement a number of minimal rules for paper reviewing and selection, whose goal is to ensure the scientific quality of the results presented at the conference week, under the supervision of the Workshop Committee. As many as 22 workshops have been hosted at IPDPS 2018.

A number of questions had to be addressed to implement such a scheme. First, a decision had to be made regarding the publication venue for workshop papers. Our publication partner Springer accepted to publish a specific volume for those papers, distinct from the volume of the main conference. All the volumes are now integrated in a collection called "Euro-Par: European Conference on Parallel Processing" (https://link.springer.com/conference/europar), but the main conference volumes and the workshop volumes are have distinct titles.

Also, a decision had to be made regarding the attendance fees. It was decided to make it possible to attend either the entire Euro-Par week, or only some of the events: main conference, workshops, etc. However, the level of the fees was clearly favoring the attendance of the entire week.

Another question was raised about the relationship between submitting a paper to the main Euro-Par conference and submitting a paper to some Euro-Par workshop. It was decided that the two procedures are completely distinct. The common submission deadline for the Euro-Par workshops is posterior by a couple of weeks to the acceptance notification of the main Euro-Par conference, so that it is possible to submit the revised version of a rejected paper. However, there is no communication between the selection committee of the main conference and those of the workshops. To be able to postpone the submission deadline for the workshop to as late as possible, it was decided that the workshop proceedings would be published after the conference. The participants are provided at the conference week with a preliminary version of the papers. The presented papers are then revised, hopefully integrating all the remarks and suggestions collected at the conference. The revised version are due typically one month after the event, and the final volume is published 3 months later.

This transition had to be made gradually. The first conference without any short papers was Euro-Par 2005. The call for papers attracted a total of 388 submissions, and 121 (regular) papers were accepted (31%). That year, the conference presented 16 topics, and a first, experimental workshop was organized by the GridCoord European initiative on grid computing, with invited speakers only. This preliminary experiment was successful, and a first call for workshops was issued in 2006, as 3 workshops were selected. There were 3 in 2007, 5 in 2008, 9 in 2009, 9 in 2010, etc. The number grew up to 18 workshops in 2014, which was barely manageable. It was decided to limit the number of workshops to 12 or so. In total, around 850 papers were presented in 134 workshops in the period from 2006 to the present. In particular, in the last years, around 60 papers were presented in the workshops altogether, slightly more than at the main conference. This balance is considered to be adequate in the long term.

It is remarkable that although new workshops dedicated to upcoming trends and paradigms are included each year, a considerable number of work-

shops are organized during 3 or more consecutive years. We should mention Hetero-Par, UCHPC and Euro-EduPar as three very successful workshops that were organized during a series of consecutive editions. In particular, Hetero-Par has taken place since 2009 (10 editions so far). During these years, researchers from USA, Europe and, during the last three years with the incorporation of Asia, were chairs of different workshops, which reflects the increasing interest of the conference around the world.

A major concern in the last years has been the coordination of the dozen of workshops. It aims at mutualizing as much as possible in the process, to increase the overall visibility and promote the reputation of the Euro-Par workshops, to the benefits of all. Also, it aims at providing a uniform insurance regarding the scientific quality of the evaluation, which is the identifying mark of the Euro-Par conference. It is made possible by requesting all the Euro-Par workshop to share a single process management environment – EasyChair (https://easychair.org/) at present. Each Euro-Par workshop has its own chair and program committee. The global process is supervised since 2011 by two general workshop chairs, delegated from the organization team and the steering committee. This approach proved very efficient. It fosters the consistency of the process across the various workshops, and also the consistency across the years. Also, it provides an objective basis to ensure the scientific quality of the accepted papers with respect to the publisher, and also to streamline the production of the proceedings.

Once consistency in the organization process has been achieved, the objectives for the future focus on adapting to the new challenges proposed by the research community. Together with the goal of attracting young researchers and PhD students, given the fact that some of the workshops have traditionally been related to european projects, the possibility of hosting european project meetings in conjunction with Euro-Par is being considered. This would contribute to increasing the scientific activity of the Euro-Par community.

Summarizing, the workshop organization is a living process that we hope will continue for many future editions of Euro-Par. Of course, this can only happen with the implication of the steering committee members, chairs, reviewers and authors that contribute to the success of the different workshops and activities. We would like to acknowledge their efforts during the previous editions.

HALL OF FAME

The Euro-Par Achievement Award

Christian Lengauer
University of Passau

Inception

At Euro-Par 2008, Ron Perrott, the first chair of the Euro-Par steering committee, was honored at the occasion of his impending retirement with a Euro-Par appreciation award. In the following year, the idea occurred to make this award into an annual affair and call it the Euro-Par Achievement Award. The award consists of a free conference attendance to be hailed and receive an honorary plaque and a personal gift at the conference banquet, and a mention on the Euro-Par Web site.

Initially, the recipients were chosen by the SC informally, but it became soon evident that a nomination procedure was required. Nominations must be submitted by a set deadline and consist of a brief dossier on the candidate, supplied by one SC member and seconded by another. The awardee must meet the following two criteria: he or she (1) must have made some major contribution to the field of parallel computing and (2) must have shown an allegiance to the Euro-Par conference series. Once the award

had been made into a series, active members of the SC were excluded from candidacy.

Here are the present eleven awardees up to but not including the 25th Euro-Par. The Web reveals their frequent other prizes and distinctions.

Lengauer and Rosenberg 2016

Euro-Par's Hall of Fame

- 2008: **Ron Perrott**, Queen's University, Belfast, United Kingdom
  Ron Perrott had been influential in parallel programming for close to four decades at the time of the award. He has been (and still is) a sought-after adviser in many matters of computer science –its technology, financing and politics– and he is a thoughtful and generous peer.
  Ron Perrott spear-headed the merger of CONPAR, VAPP and PARLE to Euro-Par and led Euro-Par as SC chair through its first years, which are always crucial for a conference series. Euro-Par was a special challenge with a serious switch in format already in its second year. Ron Perrott's calm and warm demeanor did a lot to give Euro-Par a friendly and disarming nature.

- 2009: **Paul F. Feautrier**, Ecole Normale Superiere, Lyon, France
  Paul Feautrier has been a driving force in French computer science and has made central contributions to both hardware and software (having previously done likewise in astronomy). Parallel computing has especially profited from his strong background and talent in mathematics through his theories and tools for dependence analysis, scheduling and memory management.
  Paul Feautrier was always a fatherly friend of Euro-Par and a frequent participant and presenter at its conferences up to the time of his award. He celebrated his 70th birthday a few months later and is still active in research.

- 2010: **Jack Dongarra**, University of Tennessee / Oak Ridge National Laboratory, Knoxville, U.S.A.
  Jack Dongarra is one of the internationally most prominent researchers in high-performance computing. He has made major contributions to numerical algorithms and practical parallelism. As one of the two inceptors of the TOP500 list of supercomputers, he is well-known also to people not in computer science.
  With his kind advice, Jack Dongarra gave the series as an international dimension support during its first years. He served as a keynote speaker and was co-author of a multitude of further Euro-Par papers and of a remarkable three papers in the best-papers Euro-Par Collection (2007–2016) of the journal Concurrency and Computation – Practice and Experience.

- 2011: **Michel Cosnard**, INRIA, Sophia Antipolis, France
  Michel Cosnard has made his mark on French co mputer science research institutions first as the founder of the Laboratory of Computer Science (LIP) at ENS Lyon, then as the director of several INRIA institutes, and finally as the director of all INRIA. In the latter role, he broadened the base of INRIA in France and beyond and was also instrumental in the creation of the important European institutions EIT and HRC. He was the instigator of the EU-funded CoreGrid Network of Excellence which involved 41 European Institutions and had a major impact in European grid and cloud computing. Michel has been generous with his time and expertise in promoting not just national and international ventures but the education of students and the careers of colleagues.
  Michel Cosnard was one of the major forces in forging Euro-Par out of CONPAR, VAPP and PARLE and one of the "French Revolutionaries" who introduced the topics format at the second Euro-Par. He was one of the founding members of

the Euro-Par steering committee and global chair in three years, each time of a different topic.

- 2012: **Barbara Chapman,** University of Houston, U.S.A.
  Barbara Chapman has been active in developing infrastructures for programming parallelism since the late Eighties and has participated in the development of community standards like OpenMP, OpenACC and OpenSHMEM. Her major contributions have been in programming languages for parallel computing, initially with Vienna Fortran and subsequently pioneering the widely used practical standards of parallel computing. Barbara Chapman has been a role model for females in the field of computer science and has held several senior posts in the US and around the world.
  Barbara Chapman participated in Euro-Par papers and served three times on Euro-Par programme committees, twice as global topic chair.

- 2013: **Arndt Bode**, Technical University Munich, Germany
  Arndt Bode has been one of the most influential researchers in computer architecture in Germany, especially in the design and programming of distributed systems. He has led or participated in the management of major German research programmes and has advised the German Research Foundation in the funding of the German computing infrastructure. He was for a decade VP and CIO of the TU München, then for one more decade the head of the Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities in Garching.
  Arndt Bode hosted Euro-Par 2000 in Munich, which saw the largest attendance to date of about 400 delegates. He served subsequently several times on the programme committee.

- 2014: **Henri E. Bal**, Free University, Amsterdam, The Netherlands
  Henri Bal is well-known for his contributions to parallel computer systems, languages and applications. He has also been the major driving force behind the development of the Distributed ASCI Supercomputer (DAS), a homogeneous wide-area distributed system consisting of a number of clusters in different locations, which was one of the first of its kind.
  Henri Bal has been a frequent co-author at Euro-Par and has also served as global topic chair and keynote speaker.

- 2015: **Mateo Valero**, Barcelona Supercomputing Center, Spain
  Mateo Valero has been without doubt the most influential computer scientist in Spain. He has produced incredible numbers of publications, Ph.D. graduates, committee memberships, research collaborations – even honorary doctorates! Many seminal ideas in computer architecture have been attributed to him, notably in the areas of vector computing, multihtreading and instruction-level parallelism. He also appears in the Euro-Par Collection. He established the Barcelona Supercomputing Center, which is a major focus of European activity in the area and is well regarded in the international arena as a center of excellence.
  Mateo Valero participated in the drafting of the Euro-Par series and was a member of the SC in the early years. His paper participation in Euro-Par has been steady throughout the series. Few in Europe can claim to have had the influence he has had in the field of computing in general and of parallel computing in particular.

- 2016: **Arnold L. Rosenberg**, Northeastern University, Boston, U.S.A.
  Arnold (Arny) Rosenberg is an experienced and beyond his retirement highly active researcher in algorithmic theories and models for collaborative (geographically dispersed) computing and is renowned as a generous and committed teacher and as an attentive and witty colleague.
  Arny Rosenberg is an unequivocal fan and frequent visitor of and collaborator in Europe. He has visited Euro-Par many times as participant and presenter and has also made it into the Euro-Par Collection. Recently, he brought his fervent drive for a better education in parallel computing to Euro-Par with the workshop series Euro-EDUPAR.

- 2017: **Ian Foster**: University of Chicago / Argonne National Laboratory, U.S.A.
  Ian Foster is renowned across the globe for, together with Carl Kesselman, coining the concept of grid computing, making it popular via two textbooks and putting it into practice with the GLOBUS implementation. Another influencer of paral-

lel computing is his textbook on building and designing parallel programs.
Ian Foster succeeded Jack Dongarra as international representative on the SC and matched him in kindness and support. He also co-authored a good number of Euro-Par papers and served several times as a global topic chair in the early years of the series.

- 2018: **David E. Keyes**: King Abdullah University of Science and Technology, Saudi Arabia
  David Keyes works at the algorithmic interface between parallel computing and the numerical analysis of partial differential equations. He is a leader in his field, and an orchestrator and advisor of labs and research drives. He is also a generous nurturer of his research area and an encourager of collaborations between parallel and numerical computing.
  David Keyes loves Europe and has given Euro-Par more attention than any other conference. Several of his papers received the Euro-Par label "distinguished" and two made it into the Euro-Par Collection.

A PERSONAL VIEW OF EURO-PAR

Christian Lengauer
University of Passau

I had the honor of chairing the Euro-Par Steering Committee for 17 years (2000-2017) and have been following the development of the Euro-Par conference series since its inception. Its 25th anniversary seems an appropriate point in time to review the role the series has been playing in promoting parallel computing.

Euro-Par was born out of the desire to unify the landscape of European parallel computing conferences in the 1980s. The three series CONPAR, VAPP and PARLE were discontinued, a set of guidelines for a standard conference format was drafted and Euro-Par was started with great expectations in 1995 in Stockholm. However, this first conference only had an attendance of about 130 delegates.

With the permission of the Euro-Par steering committee, under the leadership of Ron Perrott, Yves Robert and Luc Bouge, LIP in Lyon decided to try a completely different format: a set of over a dozen topics (initially called workshops), held in a number of parallel tracks, and a two-tier paper format of regular papers and short notes, the latter intended to boost attendance. The Euro-Par format was born and worked extremely well: 300 delegates came to Lyon in 1996 and it was the only year with a two-volume proceedings in Euro-Par history. I bid that year for Euro-Par 1997 in Passau. I remember that I resisted the new fine-grained topics format and wanted to go back to fewer, more wide-ranging research areas. But the steering committee insisted, and I quickly became a fan of the Lyon format and still am!

Yet, the main distinguishing feature of Euro-Par is not its topic structure –that exists also in other conference series– but the fact that all aspects of the conference are in the same hands: those of the conference hosts. This seems an increased burden but I actually experienced it as a benefit. It enables the organization team to shape the academic as well as the social elements of the event and make it a holistic and tangible experience for its attendees.

The lessons learned from individual events in a conference series form a basis for the stability and continuity of the series. In Euro-Par, this body of experience is maintained by the steering committee. In the first years of the series, the committee was composed of members elected by the Euro-Par community (the so-called advisory board) for a three-year term, plus a few non-Europeans appointed separately. In the early 2000s, it was decided to discontinue non-European participation, abandon

elections, and add every year the Euro-Par organizer of that year. I am convinced that this model of conference management has been the most influential factor in Euro-Par's stability during my chairmanship. At present, the steering committee is re-evaluating its management structure and looking for ways to rejuvenate itself.

According to the publisher Springer, Euro-Par's main achievement has been to maintain a steady course in its topic spectrum while balancing the preferences of the time. About two thirds of the topics have been classical academic themes. Variations in submission numbers were accounted for by occasionally merging two topics or expanding a topic. A few topics were introduced to address specialized schemes like grid and cloud computing or accelerator computing.

In 2004, short notes were discontinued and, under the leadership of Luc Bouge, replaced by a programme of collocated workshops that was continually expanded over the next few years. While the conference proceedings is available before the event, the workshop papers appear in a separate proceedings a few months later. Some of the workshops have been running for over a decade now and are well established platforms in their own right, others have been more experimental and have come and gone. The workshop phase and the conference phase are consecutive: the workshops in the first two days, the conference in the three days that follow. An affordable fee encourages delegates to stay through the entire week.

One additional profile element was introduced in 2008: the Euro-Par Achievement Award. This award is being conveyed yearly to an individual who has made a mark in parallel computing and has shown a commitment to the Euro-Par conference series. Nominations are solicited from the members of the steering committee and voted upon. This year, the twelfth person will be inducted into the Euro-Par Hall of Fame.

Having led the conference series for 17 years, there are several things about it that have been especially important to me.

1. Euro-Par is governed and hosted in Europe. Every last week of August, we invite colleagues from all over the world to meet in some attractive European location and advance science together.

2. Euro-Par is good value for money. Over two decades, we have been able to maintain a comparatively low fee for a full week of catering with feel-good atmosphere.

3. Euro-Par gives meaningful feedback. We have been able to maintain an average of close to four –hopefully predominantly fair and informative– reviews per submission.

4. Euro-Par is nurturing. In my view, the conference's main role has been to maintain a broad-based research community in which high-quality research on parallel computing is being reported by people who listen to and learn from each other.

5. Euro-Par is being supported by the research community. Colleagues from across Europe and further afield have been prepared to give their time and expertise to the Euro-Par vision.

Chairing the Euro-Par steering committee has been the greatest privilege in my professional life. It has allowed me to experience the diversity and expertise of Europe by interacting regularly with smart people from many nations at many beautiful European sites. I can think of no better way to experience the spirit of a united Europe.


puma

WELCOME IN GÖTTINGEN

Martina Brücher
GWDG, eScience group, HPC Team, Göttingen, Germany

Göttingen is

- a city, not very large in size, deep in heart of Germany located in the northern mountain range and nevertheless perceived worldwide
- a multidisciplinary research campus that spreads through the whole town
- history of science and living, cutting-edge research and teaching
- hip, vibrant, cosmopolitan, and at the same time cosy
- like a blooming garden, in particular in August

All this adds up to the unique Göttingen Spirit. Scientists and students from all over the world are characterizing the urban scenery. The distances are short. The city is green and colorful. Everyone is relaxed and friendly. In Göttingen you can feel like home and carry out research efficiently.

Göttingen is different

In Göttingen science and academic education play a fundamental role. With a little luck you will be privileged to experience some unique traditions.

The picture shows the most kissed girl in the world, the Gänseliesel, which could be translated Goose Lilly, one of Göttingen's most popular sights. It is common practice for every new doctor to give flowers to this eternally young lady and then kiss her. The Gänseliesel is standing in the middle of a water-filled fountain on the historic Göttingen market square. To kiss her, the candidate has to climb over the slippery water basin. For a long time this practice was forbidden, but no one followed it. This restriction was valid until 2011.

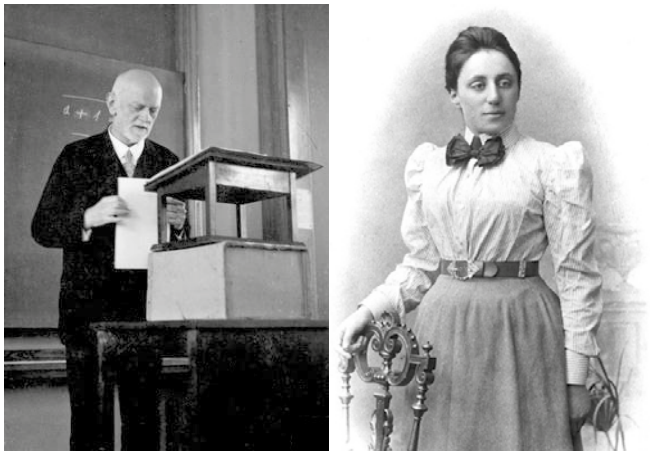
This sign reminds of the founding days of the university in the early 18th century. Because the students should concentrate on their studies, a small town in the south of the Kingdom of Hanover was chosen as the location for a new innovative university: Göttingen, a small sleepy town which until then was only known for its delicious sausages and Christmas geese. Germany as we know it today did not exist back then. The Kingdom of Hanover was co-governed by the King of England. George II. August was king at that time. The Georgia Augusta University was given his name.

Since the University was inaugurated in 1737, the scientific principles have been characterized by the spirit of the Enlightenment. Freedom of science and the commitment to excellence in research and teaching have been among its fundamental values. Outstanding notables, such as Christian Gottlob Heyne, Albrecht von Haller, Georg Christoph Lichtenberg in Göttingen shaped the first century of the university. The methodological principles of Göttingen's research have always been fundamental and experimental research and the absence of censorship.

Göttingen is strongly connected with scholars like Carl-Friedrich Gauss, Wilhelm Weber and Friedrich Wöhler.

During the first 100 years, the University of Göttingen consolidated its reputation as one of the most important mathematical and scientific centres in the world. In addition, there was and still is an important faculty of humanities, a theological faculty and a highly esteemed university medicine, which is respected beyond the borders of Göttingen as well.

The Göttinger Sieben were seven professors at the University of Göttingen, among them the Brothers Grimm, who didn't hunt monsters like a Hollywood movie makes you believe, but have researched popular stories and fairy tales and about the development of German idioms. In 1837, they dared to offer political resistance against the state power. They caused a great stir throughout Europe at a time when people began to rebel against absolutism and the corporative society.



David Hilbert und Emmy Noether

At the beginning of the 20th century, David Hilbert, whose assistants among others were Max Born and Emmy Noether, drew attention to mathematical models of calculating machines and to the theory of formal languages, which today form the basis of computer science and computer technology. By the way, the Göttingen site of the HRLN-IV is named Emmy. During this time Göttingen developed into a centre of scientific geniuses, including Karl Schwarzschild, James Franck, Ludwig Prandtl, Peter Debye, Werner Heisenberg, and Emil Wiechert. They attracted scientists and students from all over the world. In 1933, this mecca of mathematics was destroyed by the Nazis in campaigning against Jews.

After the Second World War, the University of Göttingen was the first German university to reopen its teaching activities. The university and the science location grew continuously, not last due to the location of high-ranking institutions of top-level research and innovative companies.

The Göttingen Campus was founded in 2010 as an association of major scientific institutions in Göttingen. This research campus is outstandig in Germany.

The following institutions belong to the Göttingen Campus

- University of Göttingen
- University Medical Center
- Göttingen State and University Library
- Max Planck Institute for Biophysical Chemistry
- Max Planck Institute for Dynamics and Self-Organization
- Max Planck Institute for Solar System Research
- Max Planck Institute for Experimental Medicine
- Max Planck Institute for the Study of Religious and Ethnic Diversity
- DPZ German Primate Center
- DLR German Aerospace Center
- Göttingen Academy of Sciences and Humanities
- and numerous associated organizations

One last look back in time: In the 50s of the last century Heinz Billing built one of the first computers, the so-called Göttingen calculating machine. It had 1,500 electron tubes, 6,000 germanium diodes and a magnetic core memory with 4096 words of 40 bits each. The computer could perform up to 10,000 operations per second.

We don't want to boast, but the academic careers of more around 45 Nobel Laureates are closely linked to Göttingen. Two researchers work in direct neighbourhood to the GWDG and you can meet them continually in the canteen.

THE HOSTS OF THE EURO-PAR 2019 A BRIEF INTRODUCTION

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

Georg-August-Universität Göttingen in a Nutshell

Georg-August-Universität Göttingen
Public Relations

Founded in 1737, Georg-August-Universität Göttingen is a research university of international renown with strong focuses in research-led teaching. The University is distinguished by the rich diversity of its subject spectrum particularly in the humanities, its excellent facilities for the pursuit of scientific research, and the outstanding quality of the areas that define its profile.

A University with Tradition

The University bears the name of its founder Georg August, King George II of Great Britain, Elector and Duke of Brunswick-Lüneburg, (Hannover). In affinity with the spirit of the Enlightenment, Göttingen abandoned the supremacy of theology and set its faculties on an equal footing. As an academic location Göttingen was long regarded as the hub of the mathematical world – a position lost, however, in 1933 when under Nazi rule more than 50 professors and lecturers were forced to leave the University, among them several of around 45 Nobel laureates whose names are associated with the city. After the end of World War II, Göttingen University was the first in Germany to resume its teaching operations and it went on to become one the largest higher education institutions in the country.

Göttingen Campus

The University of Göttingen regards its great research tradition and subject diversity as constituting particular strengths. Almost all academic disciplines including medicine are represented in the 13 faculties, the exception being engineering sciences. The Georg-August Universität is also distinguished by being closely integrated into a network of first-class

extra-university research establishments involving, most prominently, the Göttingen Academy of Sciences, the German Primate Center, the German Aerospace Center and five Max Planck Institutes. Together, these local partners create with the University an alliance for collaboration in research and teaching arguably unique in the Federal Republic in terms of its depth and breadth.

Studying with Excellence

Göttingen has many advantages as a location for university studies which the Georg-August-Universität is enhancing by developing innovative degree programmes, Bachelor's and Master's degree structures, carrying out a systematic internationalisation of its study programmes and implementing quality-assurance measures. Approximately 30 000 young people currently study here, some eleven percent of whom are from abroad – a clear demonstration of the pull that the University has long exerted internationally. The range of degree courses on offer stands out both for the outstandingly good study facilities in the natural and life sciences and for the breadth of subject diversity in the humanities and social sciences, a choice found at only a small number of universities in Germany.

Excellent Research Opportunities

With its full subject range, Göttingen University has the potential to bring together research interests from several different subject domains, thereby spanning new bridges in research and teaching.

And Excellent IT-Infrastructure

GWDG provides the University of Göttingen with IT services in its function as a university data centre. Since 2018, the new joint computing center for the science location has been under construction on the northern campus of the University of Göttingen. The University of Göttingen and the Max Planck Society are partners. Together with the Zuse Institute in Berlin, the University of Göttingen has also been one of the two sites of the HLRN-IV supercomputer of the North-German High Performance Computing Network (HLRN) since last year.

GWDG
Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen

GWDG

Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen in brief

Ramin Yahyapour
Geog August University Göttingen, CIO, Chair in Practical Computer Science and GWDG, Managing Director, Göttingen, Germany

Martina Brücher
GWDG, sScience group, HPC team, Göttingen, Germany

GWDG was founded in 1970 as a joint facility of Georg August Universität Göttingen and the Max Planck Society. This particular structure is unique in Germany.

GWDG serves as the data center of the University of Göttingen and as a data and IT competence center for the Max Planck Society. In this role, GWDG operates as an IT service provider for the members of the shareholders, for about 100.000 customers with around 100 employees.

In addition, GWDG is also a research centre with an eScience research group with around 50 international researchers and over 25 national and international research projects.

GWDG's reseach foci are
- High Performance Computing
- Distributed Service Infrastructure
- Resource Management and Scheduling
- Research Data Management
- Future Networks

Göttingen is a hosting site of the North-German Supercomputer HLRN-IV, a Tier-2 HPC facility that is operated jointly by GWDG and the Konrad-Zuse-Institut Berlin. In addition, GWDG maintains its own Tier-3 HPC cluster for its customers. GWDG offers an Academic Cloud for higher education institutions in the federal state of Lower Saxony and across Germany for the members of the Max Planck Society.

In close cooperation with the Göttingen State and University Library, GWDG offers IT support for students and researchers at the Göttingen Campus. In addition to the provision of hardware and software, both institutions offer consulting, support and training in the field of eScience.

Professor Dr.-Ing. Ramin Yahyapour is the managing director of GWDG. He also holds the Chair of Practical Computer Science at the University of Göttingen. His focus here is on lectures and exercises in Parallel and Service Computing. Ramin further works as CIO for the University and the University Medicine Göttingen. He is actively involved in numerous national associations and activities for the promotion of information infrastructures.

SUB | NIEDERSÄCHSISCHE STAATS- UND UNIVERSITÄTSBIBLIOTHEK GÖTTINGEN

SUB

Göttingen State and University Library

Since its founding in 1734 the Göttingen University Library has been a vital part of research activities at Göttingen University from its very beginning. The institution became the first comprehensive academic library of European standing and at that time the leading example of a modern research library.

In this spirit, Göttingen State and University Library of Lower Saxony (Niedersächsische Staats- und Universitätsbibliothek Göttingen – SUB Göttingen) continues to provide a wide range of services supporting researchers and students alike.

With its current holdings of about 8 million media units, Göttingen State and University Library ranks among the largest libraries in Germany. The library houses 14,000 historic manuscripts, more than 3,100 incunabula and 400 bequests and possesses one of the most significant collection of historical documents and printed books, materials which subsequently are being digitized by the Digital Library department.

Göttingen State and University Library offers a broad range of services for study and research purposes in its various branch libraries, including 3D scanning and printing, a virtual anatomy table and a variety of courses.

As a world-renowned competence centre, the Göttingen State and University Library offers users a wide spectrum of innovative services far beyond the city's borders and is an important partner in a number of research projects.

Göttingen State and University Library is committed to foster sustainable and free access to scientific and cultural resources and assists in every step of the research process by providing information, assistance and infrastructure from research data management to the final publication.

Bronze sculpture of Georg Christoph Lichtenberg in the courtyard of the SUB – Lower Saxony State and University Library/ Historical Building

Lichtenberg (1742-1799), Experimental physicist, mathematician, astronomer, witty satirist and sharp-sighted intellectual in the Age of Enlightenment. Famous for his aphorisms ("Sudelbücher"). His "Lectures on Natural Theory" founded physical research and teaching at the Georg-August-University. With the "Lichtenbergschen Figuren" he proved the bipolarity of electricity (+/-). Lichtenberg's chaos theories inspired Albert Einstein.

EURO-PAR 2019

TOPICS AND PROGRAMME COMMITTEE

TOPIC 1: SUPPORT TOOLS AND ENVIRONMENTS

Global Chair **João M.P. Cardoso**, University of Porto, Portugal
Local Chair **Michael Gerndt**, Technical University of Munich, Germany
Chairs **Giovanni Agosta**, Politecnico di Milano, Italy
Mary Hall, University of Utah, USA
Sally McKee, Clemson University, USA
Bernd Mohr, Jülich Supercomputing Centre (JSC), Germany
Robert Schöne, Technische Universität Dresden, Germany
Ana Lucia Varbanescu, University of Amsterdam, The Netherlands

TOPIC 2: PERFORMANCE AND POWER MODELING, PREDICTION AND EVALUATION

Global Chair **Guangming Tan**, Chinese Academy of Sciences, Institute of Computing Technology, China
Local Chair **Andreas Knüpfer**, Technische Universität Dresden, Germany
Chairs **Kaixi Hou**, Virginia Tech, USA
Jiajia Li, Pacific Northwest National Laboratory, USA
Eric Liang, Peking University, China
Weifeng Liu, China University of Petroleum
Hao Wang, The Ohio State University, USA
Junmin Xiao, Chinese Academy of Sciences, Institute of Computing Technology, China
Xiaowen Xu, IAPCM, Beijing, China
Liang Yuan, Chinese Academy of Sciences, Institute of Computing Technology, China
Jidong Zhai, Tsinghua University, China
Jing Zhang, Virgina Tech, USA
Xiuxia Zhang, Chinese Academy of Sciences, Institute of Computing Technology, China

TOPIC 3: SCHEDULING AND LOAD BALANCING

Global Chair **Andrei Tchernykh**, CICESE Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico
Local Chair **Sascha Hunold**, TU Vienna, Austria
Chairs **Zhihui Du**, Tsinghua University, China
Fanny Dufossé, Inria Grenoble – Rhone-Alpes, France
Matthias Mnich, University of Bonn, Germany
Risat Mahmud Pathan, Zenuity AB, Sweden
Krzysztof Rzadca, Google and University of Warsaw, Poland
Franciszek Seredynski, Cardinal Stefan Wyszy ski University in Warsaw, Poland
Bertrand Simon, University of Bremen, Germany
Victor Toporkov, National Research University „Moscow Power Engineering Institute“, Russia
Nodari Vakhania, Autonomous University of the State of Morelos, Mexico
Frank Werner, University of Magdeburg, Germany
Prudence Wong, University of Liverpool, UK

TOPIC 4: HIGH PERFORMANCE ARCHITECTURES AND COMPILERS

Global Chair **Pedro Petersen Moura Trancoso**, Chalmers University of Technology, Sweden
Local Chair **Matthias Müller**, RWTH Aachen, Germany
Chairs **Angelos Arelakis**, ZeroPoint Technologies, Sweden
Alexandra Jimborean, Uppsala University, Sweden
Nuno Roma, Universidade de Lisboa, Portugal
Josef Weidendorfer, Technical University of Munich, Germany

TOPIC 5: DATA MANAGEMENT, ANALYTICS AND DEEP LEARNING

Global Chair **Alexandru Iosup**, Vrije Universiteit Amsterdam, The Netherlands
Local Chair **Morris Riedel**, Jülich Supercomputing Centre, Germany
Chairs **Zeynep Akata**, University of Amsterdam, The Netherlands
Jorge Amaya, Katholieke Universiteit Leuven. The Netherlands
Ira Assent, Aarhus University, Denmark
Gabriele Cavallaro, Jülich Supercomputing Centre (JSC), Germany
Aaron Ding, Delft University of Technology, The Netherlands
Dmitry Duplyakin, University of Utah, USA
Ernir Erlingsson, University of Iceland, Iceland
Jens Henrik Goebbert, Jülich Supercomputing Centre (JSC), Germany
Markus Goetz, Karlsruhe Institute of Technology (KIT), Germany
Jenia Jitsev, Jülich Supercomputing Centre (JSC), Germany
Volodymyr Kindratenko, University of Illinois at Urbana-Champaign, USA
Kwo-Sen Kuo, Bayesics LLC, USA
Bastian Leibe, RWTH Aachen, Germany
Helmut Neukirchen, University of Iceland
Rahul Ramachandran, NASA, USA
Tomas Runarsson, University of Iceland
Animesh Trivedi, Vrije Universiteit (VU), Amsterdam, The Netherlands
Alexandru Uta, Vrije Universiteit Amsterdam, The Netherlands
Ana Lucia Varbanescu, University of Amsterdam, The Netherlands
Laurens Versluis, Vrije Universiteit Amsterdam, The Netherlands
Lin Wang, Vrije Universiteit Amsterdam, The Netherlands
Xiaoxiang Zhu, DLR German Aerospace Center, Oberpfaffenhofen, Germany, Technical University of Munich, Germany

TOPIC 6: CLUSTER AND CLOUD COMPUTING

Global Chair **Anne-Cécile Orgerie**, CNRS, IRISA, Rennes, France
Local Chair **Uwe Schwiegelshohn**, Technische Universität Dortmund, Germany
Chairs **Alexandra Carpen-Amarie**, Fraunhofer ITWM, Kaiserslautern Germany
Sebastien Lafond, Åbo Akademi University, Turku, Finland
Maciej Malawski, AGH University of Science and Technology, Krakow, Poland
María S. Pérez, Universidad Politécnica de Madrid, Spain
Rizos Sakellariou, University of Manchester, U.K.

TOPIC 7: DISTRIBUTED SYSTEMS AND ALGORITHMS

Global Chair **Dick Epema**, Delft University of Technology, The Netherlands
Local Chair **Franz-Josef Pfreundt**, Fraunhofer Institute for Industrial Mathematics, Germany
Chairs **György Dán**, KTH – Kungliga Tekniska Högskolan, Sweden
Asterios Katsifodimos, Delft University of Technology, The Netherlands
Stefanie Roos, Delft University of Technology, The Netherlands
François Taïani, IRISA/INRIA Rennes, France

TOPIC 8: PARALLEL AND DISTRIBUTED PROGRAMMING, INTERFACES, AND LANGUAGES

Global Chair **Mitsuhisa Sato**, RIKEN Centre for Computational Science, Japan
Local Chair **Christian Simmendinger**, T-Systems, Stuttgart, Germany
Chairs **Olivier Aumage**, INRIA, Le Chesnay, France
Vicenc Beltran, Barcelona Supercomputing Center, Spain
Marc Gonzalez, Universitat Politècnica de Catalunya, Spain
Changhee Jung, Virginia Tech, USA
Karla Morris, Sandia National Laboratories, USA
Alessandro Pellegrini, Sapienza University of Rome, Italy
Mirko Rahn, Fraunhofer ITWM, Germany
Miwako Tsuji, RIKEN, Japan
Tom Vander Aa, Exascience Lab at imec, Belgium
Masahiro Yasugi, Kyushu Institute of Technology, Japan

TOPIC 9: MULTICORE AND MANYCORE PARALLELISM

Global Chair **Barbara Chapman**, Stony Brook University, New York, USA
Local Chair **Guido Juckeland**, Helmholtz-Zentrum Dresden-Rossendorf, Germany
Chairs **Sridutt Bhalachandra**, Argonne National Laboratory Chicago, USA
Sunita Chandrasekaran, University of Delaware, USA
Rudi Eigenmann, University of Delaware, USA
Oscar Hernandez, Oak Ridge National Laboratory, USA
Konstantinos Krommydas, Intel, USA
Cheng Wang, University of Houston, USA
Rengan Xu, Dell EMC, USA

TOPIC 10: THEORY AND ALGORITHMS FOR PARALLEL COMPUTATION AND NETWORKING

Global Chair **Frédéric Vivien**, Inria, Le Chesnay, France
Local Chair **Henning Meyerhenke**, Humboldt-Universität zu Berlin, Germany
Chairs **Kamer Kaya**, Sabanci University, Turkey
Fanny Pascual, Sorbonne Université, France
Cynthia Phillips, Sandia National Labs, Albuquerque, NM, USA
Peter Sanders, Karlsruhe Institute of Technology (KIT), Germany

TOPIC 11: PARALLEL NUMERICAL METHODS AND APPLICATIONS

Global Chair **Daniel Kressner**, École polytechnique fédérale de Lausanne, Switzerland
Local Chair **Cornelia Grabe**, DLR German Aerospace Center, Institute of Aerodynamics and Flow Technology Göttingen, Germany
Chair **Thomas Gerhold**, DLR German Aerospace Center, High Performance Computing, Institute of Software Methods for Product Virtualization Dresden, Germany

TOPIC 12: ACCELERATOR COMPUTING

Global Chair **Raphael Y. de Camargo**, Federal University of ABC, Brasil
Local Chair **Christian Plessl**, Paderborn University, Germany
Chairs **Pedro Diniz**, INESC-ID, Lisboa, Portugal
Holger Fröning, University of Heidelberg, Germany
Francisco D. Igual, Universidad Complutense de Madrid, Spain
Miriam Leeser, Northern Eastern University, USA
Andy Nisbet, University of Manchester, UK

TOPIC 13: ALGORITHMS AND SYSTEMS FOR BIOINFORMATICS

Global Chair **Folker Meyer**, Argonne National Laboratory Chicago, USA
Local Chair **Alexander Sczyrba**, University of Bielefeld, Germany
Chairs **Christophe Blanchet**, CNRS-IFB, France
Shane Canon, Lawrence Berkeley **National Laboratory**, USA
Rob Finn, EBI, U.K.
Ananth Grama, Purdue University, USA

TOPIC 14: ALGORITHMS AND SYSTEMS FOR DIGITAL HUMANITIES

Global Chair **Iryna Gurevych**, Technische Universität Darmstadt, Germany
Local Chair **Marco Büchler**, Leibniz Institute of European History Mainz, Germany
Chairs **Sayeed Choudhury**, Sheridan Libraries of Johns Hopkins University, Baltimore, USA
Eckart de Castilho, Technische Universität Darmstadt, Germany
Mark Hedges, King's College London, U.K.
Andrea Scharnhorst, DANS-KNAW, The Netherlands

WORKSHOP PROGRAMME

(W 1) LSDVE

Seventh Workshop on Large Scale Distributed Virtual Environments

Date Monday 29.08.2019, 9:00 – 15:30
Location: Heyne-Haus 1, Papendieck 16, 37073 Göttingen, left room

Scope The recent advances in networking have determined an increasing use of information technology to support distributed networked cooperative applications. Several novel applications have emerged in this area: social networks, distributed cryptocurrencies, collaborative work and many other ones. In particular, an interesting technology recently adopted to handle cryptocurrencies (such as bitcoin) is the block-chain technology, that has now taken the more general role to handle several distributed applications. Furthermore, peer to peer, Internet of Things, Smart-cities, distributed sensing are examples of modern ICT paradigms that aim to describe globally cooperative infrastructures built upon objects' intelligence and self-configuring capabilities. This workshop aims to provide a venue for researchers to present and discuss important aspects of large scale networked collaborative applications and of the platforms supporting them.

Workshop Chairs • Laura Ricci, University of Pisa, Italy • Radu Prodan, University of Klagenfurt, Austria • Barbara Guidi, University of Pisa, Italy

Agenda
09:00 – 09:30
Laura Ricci, University of Pisa; Welcome

09:30 – 10:30
Gyan Ranjan, Senior Director of Data Science at Albeado Inc., San José, CA, USA; *Keynote: From complexity to explanations: an emergent view of autonomy in large scale distributed environment*

10:30 – 11:00 Coffee Break

11:00 – 11:30
Barbara Guidi and Andrea Michienzi; Bitcoin price variation: ana analysis of the correlations

11:30 – 12:00
Domenico Talia, Paolo Trunfio, Fabrizio Marozzo, Loris Belcastro, Javier Garcia-Blas, David del Rio, Philippe Couvee, Gael Goret, Lionel Vincent, Alberto Fernandez-Pena, Daniel Martin de Blas, Mirko Nardi, Teresa Pizzuti, Adrian Spataru and Marek Justyna;
A novel Data-Centric Programming Model for Large-Scale Parallel Systems

12:00 – 12:30
Dong Nguyen Doan, Daniela Zaharie and Dana Petcu;
Auto-Scaling for a Streaming Architecture with Fuzzy Deep Reinforcement Learning

12:30 – 14:00 Lunch Break

14.00 – 14.30
Radu Prodan, Nishant Saurabh, Zhiming Zhao, Kate Orton-Johnson, Antorweep Chakravorty, Aleksandar Karadimce and Alexandre Ulisses;
ARTICONF: Towards a Smart Social Media Ecosystem in aBlockchain Federated Environment

14.30 – 15.00
Zeshun Shi, Huan Zhou, Yang Hu, Spiros Koulouzis, Carlos Rubia and Zhiming Zhao;
Co-located and Orchestrated Network Fabric (CONF): An Automated Cloud Virtual Infrastructure for Social Network Applications

15.00 – 15.30
Zahra Najafabadi Samani, Alexander Lercher, Nishant Saurabh and Radu Prodan; *A Semantic Model for Self-Adaptive and Autonomous Relevant Technology for Social MEdia Applications*

(W 2) COLOC

3rd Workshop on Data Locality

Date Monday 29.08.2019, 9:00 – 12:45
Location: SUB/HG Vortragsraum, Papendiek 14, 37073 Göttingen, 1. floor right room

Scope A well-known handicap for HPC applications running on modern highly parallelized and heterogeneous HPC platforms is that an increasing amount of time is spent in communication and data transfers; thus, it is necessary to design, implement and validate new approaches to optimize process placement and data locality management. The goal of this workshop is to gather the community around this subject.

Workshop Chair • Emmanuel Jeannot, INRIA/LaBRI, Bordeaux, France

Agenda
9:00 – 9:15
Emmanuel Jeannot, INRIA/LaBRI, Bordeaux, France;
Welcome and introduction of the workshop

9:15 – 10:10
Leonel Sousa, Universidade de Lisboa (UL), Lisbon, Portugal; *Invited talk (TBA)*

10:10 – 10:30
Karl Fürlinger, Ludwig-Maximilians-University (LMU)

Munich, Germany;
Poster session presentation

10:30 – 11:00 am Coffee Break

11:00 – 11:25
Kernel Merge, Nabeeh Jumah and Julian Kunkel; *Optimizing Memory Bandwidth Efficiency with User-Preferred*

11:25 – 11:50
Brice Goglin and Andrès Rubio Proaño; *Opportunities for Partitioning Non-Volatile Memory DIMMs between Co-scheduled Jobs on HPC Nodes*

11:50 – 12:45
Didem Unat, Koç Universitesi stanbul, Turkey; *Invited talk: Programming for Data Locality and Parallelism*

(W 3) ParaMo 2019

1st International Workshop on Parallel Programming Models in High-Performance Cloud

Date Monday 29.08.2019, 9:00 – 12:15
Location: Heyne-Haus 2, Papendieck 16, 37073 Göttingen, right room

Scope The 1st International Workshop on Parallel Programming Models in High-Performance Cloud will provide a venue for researchers to discuss recent results and the future challenges to parallel programming models in high-performance cloud.

Workshop Chairs • Sangyoon Oh, Ajou Univ., Korea • Hyun-Wook Jin, Konkuk Univ., Korea

Agenda
09:00 – 09:15
Sangyoon Oh, Ajou Univ., Korea;
Opening Remarks

09:15 – 09:45
Beytullah Yildiz and Murat Tezgider;
Learning Quality Improved Word Embedding with Assessment of Hyperparameters

09:45 – 10:15
Lauritz Thamsen, Ilya Verbitskiy, Sasho Nedelkoski, Vinh Thuy Tran, Vinícius Meyer, Miguel G. Xavier, Odej Kao and César A. F. De Rose; Hugo: *A Cluster Scheduler that Efficiently Learns to Select Complementary Data-Parallel Jobs*

10:15 – 10:30 Discussion

10:30 – 11:00 Coffee Break

11:00 – 11:30
Gennaro Cordasco, Matteo D'Auria, Alberto Negro, Vittorio Scarano and Carmine Spagnuolo;
FLY: A Domain-Specific Language for Scientific Computing on FaaS

11:30 – 12:00
Beytullah Yildiz; High Performance Queries Using Compressed Bitmap Indexes

12:00 – 12:15 Discussion

(W 4) HPCN

High-Performance Computing and Networking in Aerospace Workshop 2019

Date Monday 26.08.2019, 14:00 – 17:05
Location:SUB/HG Vortragsraum, Papendiek 14, 37073 Göttingen, 1. Floor, right room

Scope The "HPCN in AeroSpace" workshop comprises contributions from aerospace research and from HPC hard- and software providers. The presentations from aerospace research are on larger-scale applications employing HPC including specific requirements, achievements and limitations related to HPC. The keynotes given by the providers cover current and future development in HPC Hardware and Software.

Workshop Chairs • Dieter Schwamborn, German Aerospace Center (DLR), Göttingen, Germany • Cornelia Grabe, German Aerospace Center (DLR), Göttingen, Germany • Alfred Geiger, T-Systems, Germany

Agenda
14:00 – 14:05
Dieter Schwamborn, German Aerospace Center (DLR), Göttingen, Germany, Alfred Geiger, T-Systems, Germany;
Brief welcome address by the organizers

14:05 – 14:35
Johannes Holke, Alexander Rüttgers, Margrit Klitz, Achim Basermann, German Aerospace Center (DLR), Cologne, Germany;
Data-adapted Parallel Merge Sort

14:35 – 15:00
André Heidekrüger, AMD Munich, Germany;
AMD is back in HPC in a big way (invited)

15:00 – 15:30
Axel Probst, Tobias Knopp, Cornelia Grabe, German Aerospace Center (DLR),Göttingen, Germany and Jens Jägersküpper, German Aerospace Center (DLR), Brunswick, Germany; *HPC Requirements of High-Fidelity Flow Simulations for Aerodynamic Applications*

15:30 – 16:00 Coffee break

16:00 – 16:30
Frederik Unger, NEC HPC Europe, Stuttgart, Germany;
NEC HPC Technology outlook (invited)

16:30 – 17:00
Rigel Alves and Anderas Knüpfer, TU Dresden, Germany; *In Situ Visualization of Performance-Related Data in Parallel CFD Applications*

17:00 – 17:30
Fritz Schinkel, Fujitsu, Competence Center Big Data, Munich, Germany; *Quantum and Digital Annealing – Concepts and Use Cases (invited)*

17:30 – 17.35
Brief wrap-up of the workshop

(W5) PMACS

Performance Monitoring and Analysis of Cluster Systems

Date Monday 26.08.2019, 14:00 – 17:30
Location: Heyne-Haus 2, Papendieck 16, 37073 Göttingen, right room

Scope For a long time, hardware performance monitoring was used on a small scale to measure and analyze data of single application runs in order to detect performance limitations caused by hardware and/or software. Monitoring the whole cluster system for observing hardware failures has been the duty of system administrators with emphasis on operating the system and changes in the system parameters. In recent years, many HPC providers have extended or replaced their monitoring system to additionally track performance data from hardware monitoring facilities and even from the applications. The analysis of the data provides deeper insight in resource utilization and the quality of software. In addition, system administrators use performance data to track the causes of system instabilities to specific user codes. Due to the diversity of HPC centers, many tailored solutions for collection, storage, evaluation and visualization exist today. The workshop wants to bring together developers and users of such infrastructure in order to find ways of collaboration and exchange ideas for further developments.

Workshop Chairs • Thomas Gruber, Friedrich-Alexander-University Erlangen-Nuremberg (FAU), Erlangen Regional Computing Center (RRZE), Erlangen, Germany • Anthony Danalis, University of Tennessee, Department of Electrical Engineering and Computer Science, Knoxville, USA

Agenda
14:00 – 15:00
Stephane Eranian, Google. Mountain View, CA, USA; *Keynote TBA*

15:00 – 15:30
Luka Stanisic and Klaus Reuter; *MPCDF HPC Performance Monitoring System: Enabling Insight via Job-Specific Analysis*

15:30 – 16:00 Coffee Break

16:00 – 16:30
Philipp Neumann; *Sparse Grid Regression for Performance Prediction Using High-Dimensional Run Time Data*

16:30 – 17:00
Gence Ozer, Sarthak Garg, Neda Davoudi, Gabrielle Poerwawinata, Matthias Maiterth, Alessio Netti and Daniele Tafani; *Towards a Predictive Energy Model for HPC Runtime Systems Using Supervised Learning*

17:00 – 17:30
Saurav Nanda, Ganapathy Parthasarathy, Parivesh Choudhary and Arun Venkatachar; *Resource Aware Scheduling for EDARegression Jobs*

(W 6) HeteroPar 2019

Seventeenth International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms

Date:Tuesday 27.08.2019, 9:00 -18:00
Location: Alte Mensa, Wilhlemsplatz 3, 37073 Göttingen, Room 1 (Emmy-Noether-Saal)

Scope Heterogeneity is emerging as one of the most profound and challenging characteristics of today's parallel environments. From the macro level, where networks of distributed computers, composed of diverse node architectures, are interconnected with potentially heterogeneous networks, to the micro level, where deeper memory hierarchies and various accelerator architectures are increasingly common, the impact of heterogeneity on all computing tasks is increasing rapidly. Traditional parallel algorithms, programming environments and tools, designed for legacy homogeneous multiprocessors, will at best achieve a small fraction of the efficiency and the potential performance that we should expect from parallel computing in tomorrow's highly diversified and mixed environments. New ideas, innovative algorithms, and specialized programming environments and tools are needed to efficiently use these new and multifarious parallel architectures. The workshop is intended to be a forum for researchers working on algorithms, programming languages, tools, and theoretical models aimed at efficiently solving problems on heterogeneous platforms.

Workshop Chairs • Domingo Giménez, University of Murcia, Spain • Alexey Kalinov, Cadence Design Systems, Russia • Alexey Lastovetsky, University College Dublin, Ireland • Radu Prodan, University of Klagenfurt, Austria • Yves Robert, Ecole Normale Supérieure de Lyon, France • Leonel Sousa, INESC-ID/IST, Universidade de Lisboa, Portugal • Denis Trystram, University Grenoble-Alpes, France

Agenda
9:00 - 09:15 Welcome from Steering Committee and Program Chair Alexey Lastovetsky

Session 1: TBA
Chair: Alexey Lastovetsky

09:15 - 10:00
Jesus Carretero, Polytechnic School of University Carlos III of Madrid, Spain; *Scientific keynote: TBA*

10:00 -10:30
Adrian Schmitz, Joachim Protze, Lechen Yu, Simon Schwitanski and Matthias Mueller; *DataRaceOnAccelerator - A Micro-Benchmark Suite for Evaluating Correctness Tools Targeting Accelerators*

10:30 –11:00 Coffee break - possible from 10:00, Location: Alte Mensa

Session 2: Scheduling
Chair: Emmanuel Jeannot

11:00 -11:30
Kods Trabelsi, Loïc Cudennec and Rihab Bennour; *Application Topology Definition and Tasks Mapping for Efficient Use of Heterogeneous Resources*

11:30 -12:00
Maciej Pawlik, Pawel Banach and Maciej Malawski; *Adaptation of Workflow Application Scheduling Algorithm to Serverless Infrastructure*

12:00 - 12:30
Robert Dietze and Gudula Ruenger; *Search-based Scheduling for Parallel Tasks on Heterogenous Platforms*

12:30 - 14:00 Lunch break, Location: Alte Mensa

Session 3: Performance modelling and tuning
Chair: Denis Trystram

14:00 - 14:30
Gyan Ranjan, Albeado Inc., Santa Clara, CA (USA); *Industrial keynote: On Explainability of Autonomous Heterogeneous Systems: A Network Theoretic Approach to AI*

14:30 - 15:00
Jaroslav Olha, Jana Hozzová, Jan Fousek and Ji í, Filipovi; *Using historical information to improve autotuning*

15:00 -15:30
Matthias Lüders, Oliver Jakob Arndt and Holger Blume; *Multicore Performance Prediction – Comparing Three Recent Approaches in a Case Study*

15:30 -16:00 Coffee break, Location: Alte Mensa

Session 4: Heterogeneous computing
Chair: Leonel Sousa

16:00 -16:30
Jiajian Xiao, Philipp Andelfinger, Wentong Cai, Paul Richmond, Alois Knoll and David Eckhoff; *Advancing Automatic Code Generation for Agent-Based Simulations on Heterogeneous Hardware*

16:30-17:00
Jacob Lambert, Seyong Lee, Allen Malony and Jeffrey Vetter; *CCAMP: OpenMP and OpenACC Interoperable Framework*

17:00 - 17:30
Hamidreza Khaleghzadeh, Muhammad Fahad, Ravi Reddy Manumachu and Alexey Lastovetsky; *Optimization of Data-Parallel Applications on Heterogeneous HPC Platforms for Dynamic Energy Through Workload Distribution*

17:30 - 18:00
Lukasz Szustak, Roman Wyrzykowski, Kamil Halbiniak and Pawel Bratek; *Toward Heterogeneous MPI+MPI Programming: Comparison of OpenMP and MPI Shared Memory Models*

(W7) FPDAPP

2nd International Workshop on Future Perspective of Decentralized Applications

Date Tuesday 27.08.2019, 9:00 –17:30
Location:SUB/HG, Papendiek 14, 37073 Göttingen, 1. floor left

Scope Blockchain technologies (BCTs) make agreement amongst untrusted parties possible, without the need for certification authorities. Almost 10 years down the stream of the introduction of BCTs, FPDAPP aims to evaluate the potentiality of the novel decentralised frameworks and applications. Of particular interest is the evaluation and comparison of killer applications that are showing evidence of how BTC can revolutionize their domains or developing new application areas. Evaluation and comparisons are broadly understood, form technical aspects regarding the novel decentralised computer to the possible impact on society, business and the public sector.

The FDPAPP Workshop will have a special look at breakthrough applications.

Workshop Chairs • Andrea Bracciali, Stirling University, U.K. • Claudio Schianella, University of Turin, Italy

Agenda
09:00 –09:05 N.N.; Welcome from the chairs

09:05 –09:30
Lin Zhang, Brian Lee, Yuhang Ye and Yuansong Qiao; *Ethereum Transaction Performance Evaluation using Test-nets*

09:30 –10:00
Michele Marchesi, Andrea Pinna, Francesco Pisu and Roberto Tonelli; Crypto-Trading. Rechargeable to-

ken-based smart energy market enabled by blockchain and IoT technology

10:00 – 10:30
Marco Zecchini, Andrea Bracciali, Ioannis Chatzigiannakis and Andrea Vitaletti; Smart Contract Design Patterns: a use case on water management

10:30 – 11:00 Coffee break

11:00 – 12:00
N.N.; Invited talk

12:00 – 12:30
Evgeniia Filippova;
Blockchain Materialization as a General Purpose Technology: a Research Framework

12:30 – 14:00 Lunch break

14:00 – 14:30
Axel Curmi and Frankie Inguanez;
Academic Achievement Recognition and Verification using Blockchain

14:30 – 15:00
Alevtina Dubovitskaya, Luca Mazzola and Alexander Denzler; Towards a trusted support platform for the job placement task

15:00 – 15:30
Marcel Müller and Sandro Rodriguez Gazon;
Blockchain-based Trusted Cross-organizational Deliveries of Sensor-equipped Parcels

015:30 – 16:00 Coffee break

16:00 – 16:30
N.N.; Networking session

16:30 – 17:30
N.N.; Panel – Governance for the blockchain: lesson learned from projects;

(W8) PDCLifeS

Parallel and Distributed Computing for Life Sciences: Algorithms, Methodologies, and Tools

Date Tuesday 27.08.2019, 9:00 – 12:30
Location: Heyne-Haus 1, Papendieck 16, 37073 Göttingen, left room

Scope Advancements in Life Sciences are largely driven by the development of powerful technologies and computational tools. Applications range from drug discovery and personalized medical therapies to improved agricultural and green energy production. However, the solution of world-real problems requires a multidisciplinary approach and poses new challenges to the field of High-Performance Computing (HPC) at different levels:

- modeling and simulation of complex phenomena (human organ functions, evolution of diseases, sustainable energy systems, etc.)
- processing and analysis of massive amounts of data produced by modern technologies (omics and genome sequencing, functional and anatomical imaging, High-Content Screening, etc.)
- extracting, merging and understanding of information from different sources (merging different types of images, bridging imaging and omics data, etc.)
- storage, security, and availability of datasets (in order to gather information, compare results, reproduce the experiments, etc.)

The PDCLifeS Workshop is oriented to explore the key role of HPC algorithms, methodologies and tools for solving problems related to different branches of Life Sciences (Biology, Biomedicine, Bioengineering, Ecology, etc.).

Workshop Chairs
- Laura Antonelli, Institute for High-Performance Computing and Networking, Consiglio Nazionale delle Ricerche (CNR, Rome, Italy
- Salvatore Cuomo, University of Naples „Federico II", Naples, Italy

Agenda
09:00 – 09:30
Giuseppe Agapito, Mario Cannataro, Pietro Hiram Guzzi and Marianna Milano; *Parallel Learning of Weighted Association Rules in Human Phenotype Ontology*

09:30 – 10:00
Tom Haber and Frank van Reeth; *Improving the runtime performance of non-linear mixed-effects model estimation*

10:00 – 10:30
Mattia Conte, Andrea Esposito, Luca Fiorillo, Carlo Annunziatella, Alfonso Corrado, Francesco Musella, Renato Sciarretta, Andrea Maria Chiariello and Simona Bianco; *Hybrid Machine Learning and Polymer Physics approach to investigate 3D chromatin structure*

10:30 – 11:00 Coffee Break

11:00 – 11:30
Rossella Arcucci, Laetitia Mottet, Cesar A Quilodran Casas, Florian Guitton, Christopher Pain and Yi-Ke Guo; *Adaptive Domain Decomposition for Effective Data Assimilation*

11:30 – 12:00
Sina Salimzadeh and Sara Kandulu; *Application of Wavelet Transform in Teeth Segmentation of Bitewing X-Ray Images*

12:30 – 14:00 Lunch Break

(W9) F2C-DP

3rd Workshop on Fog-to-Cloud Distributed Processing

Date Tuesday 27.08.2019, 9:00 – 12:30
Location: Heyne-Haus 2, Papendieck 16, 37073 Göttingen, right room

Scope Future service execution in different domains (e.g. smart cities, smart transportation, smart energy, e-health, etc.), will rely on a large and highly heterogeneous set of widely distributed devices, located from the edge up to the cloud, empowering the development of innovative services. The workshop aims at bringing together the community of researchers interested in new applications, architectures, programming models, applications and systems based on these computing environments.

Workshop Chairs • Rosa M.Badia, Barcelona Supercomputing Center), Spain • Antonio Salis, Engineering Sardegna, Roma, Italy • Xavi Masip, Universitat Politècnica de Catalunya, Basrcelona, Spain • Admela Jukan, Technische Universität Braunschweig), Germany • Ana Juan, ATOS SA, Spain

Agenda
9:00 – 9:10 Rosa M. Badia, Barcelona Supercomputing Center (BSC), Spain; *Welcome and workshop introduction*

9:10 – 10.10 Massimo Villari, University of Messina, Italy; *Keynote: Cloud has inspired Edge and Fog Computing: are we ready to see them as a whole?*

10.10 – 10.30 Xavi Masip Bruin, Eva Marin Tordera, Rosa Maria Badia, Antonio Salis, Ana Juan Ferrer, Jens Jensen, John Kennedy, Matija Cankar, Admela Jukan, Andrea Bartoli and Marc Elian Begin; *mF2C: The Evolution of Cloud Computing towards an Open and Coordinated Ecosystem of Fogs and Clouds*

10.30 – 11.00 Coffee Break

11.00 – 11.20 Massimo Gaggero, Giovanni Busonera, Luca Pireddu and Gianluigi Zanetti; TDM Edge Gateway: *a flexible microservice-based edge gateway architecture for heterogeneous sensors*

11.20 – 11.40 Antonio Salis, Jens Jensen, Roberto Bulla, Glauco Mancini and Paolo Cocco; *Security and Privacy management in a fog-to-cloud environment*

11.40 – 12.00 Sa o Stanovnik and Matija Cankar; *On the similarities and differences between the Cloud, Fog and the Edge*

12.00 – 12.30 Rosa M. Badia, Barcelona Supercomputing Center (BSC), Spain; Antonio Salis, Engenieerng Sardegna S-r-l- (ENG), Roma, Italy; Domenico Talia, Università della Calabria , Rende, CS, Italy; *Panel: Emerging trends, technologies, challenges and business scenarios in Fog to Cloud architectures" (incl. Q/A session with all participants)*

12.30 – 14.00 End of Workshop / Lunch break

(W10) Auto-DaSP 2019

Third International Workshop on Autonomic Solutions for Parallel and Distributed Data Stream Processing

Date Tuesday 27.08.2019, 14:00 – 17:30
Location:Heyne-Haus 1, Papendieck 16, 37073 Göttingen, left room

Scope The Auto-DaSP workshop contains contributions in the area of Data Stream Processing with particular emphasis on supports for highly parallel platforms and autonomic features to deal with variable workloads.

Chairs • Massimo Torquati, University of Pisa, Italy • Valeria Cardellini, Università degli Studi di Roma, Italy • Gabriele Mencagli, University of Pisa, Italy

Agenda
14:00 Welcome by the Workshop Chairs

14:00 – 14:15
Marco Aldinucci, University of Turin;
Presentation: *The European High-Performance Computing EuroHPC JU initiative explained*

14:15 – 14:40
Daniele De Sensi, Marco Danelutto; *Transparent Autonomicity for OpenMP Applications*

14:40 – 15:05
Constantin Pohl, Kai-Uwe Sattler; *Parallelization of Massive Multiway Stream Joins on Manycore CPUs*

15:05 – 15:30
Adriano Vogel, Dalvan Griebler, Marco Danelutto and Luiz Gustavo Fernandes; *Minimizing Self-Adaptation Overhead in Parallel Stream Processing for Multi-Cores*

15:30 – 16:00 Coffee break

16:00 – 16:25
Mehdi Mokhtar Belkhiria, Cédric Tedeschi;
A Fully Decentralized Autoscaling Algorithm for Stream Processing Applications

16:25 – 16:50
Christoph Kessler, Sebastian Litzinger, Jörn Keller;
Adaptive crown scheduling for streaming tasks on many-core systems

16:50 – 17:20
Daniele De Sensi, University of Pisa; *Tutorial/Demo by Adding autonomic and power-aware capabilities to parallel streaming applications with the Nornir framework*

17:20 – 17:30
Wrap-up and Closing by the Workshop Chairs

(W11) Resilience

12th Workshop on Resiliency in High Performance Computing in Clusters, Clouds, and Grids

Date: Tuesday 27.08.2019, 14:00 – 17:30
Location: Heyne-Haus 2, Papendieck 16, 37073 Göttingen, right room

Scope: Resilience is a critical challenge as high performance computing (HPC) systems continue to increase component counts, individual component reliability decreases (such as due to shrinking process technology and near-threshold voltage (NTV) operation), software complexity increases, and architectures become more heterogeneous. Application correctness and execution efficiency, in spite of frequent faults, errors, and failures, is essential to ensure the success of the extreme-scale HPC systems, cluster computing environments, Grid computing infrastructures, and Cloud computing services.

Resilience for HPC systems encompasses a wide spectrum of fundamental and applied research and development, including theoretical foundations, fault detection and prediction, monitoring and control, end-to-end data integrity, enabling infrastructure, and resilient solvers and algorithm-based fault tolerance. This workshop brings together experts in the community to further research and development in HPC resilience and to facilitate exchanges across the computational paradigms of extreme-scale HPC, cluster computing, Grid computing, and Cloud computing.

Workshop Chairs • **Domingo Giménez**, University of Murcia, Spain • **Alexey Kalinov,** Cadence Design Systems, Russia • **Alexey Lastovetsky**, University College Dublin, Ireland • **Radu Prodan**, University of Klagenfurt, Austria • **Yves Robert**, Ecole Normale Supérieure de Lyon, France • **Leonel Sousa**, INESC-ID/IST, Universidade de Lisboa, Portugal • **Denis Trystram**, University Grenoble-Alpes, France

Agenda
Session 1 | 14:00 – 14:30
Opening: Resilience Workshop Organizers

14:30 – 15:00
Scott Levy and Kurt Ferreira; *Space-Efficient Reed-Solomon Encoding to Detect and Correct Pointer Corruption*

15:00 – 15:30
Maher Salloum, Jackson Mayo and Robert Armstrong; *Physics-Based Checksums for Silent-Error Detection in PDE Solvers*

15:30 – 16:00 Coffee Break

Session 2 | 16:00 – 16:30
Max Baird, Sven-Bodo Scholz, Artjoms Sinkarovs and Leonardo Bautista-Gomez; *Checkpointing Kernel Executions of MPI+CUDA Applications*

16:30 – 17:00
Carlos E. Gomez, Jaime Chavarriaga, Harold E. Castro and Andrei Tchernykh; *Improving Reliability for provisioning of virtual machines in Desktop Clouds*

17:00 – 17:30
Closing: Resilience Workshop Organizers

INTEL Tutorial

Date: Tuesday 27.08.2019
Location: SUB/HG, Papendiek 14, 37073 Göttingen, Vortragsraum, 1. floor right
Speaker: Fabio Baruffa

Agenda
9:00 – 10:30
Morning session: Artificial Intelligence on Intel Hardware Platforms
- Intel's Hardware and Software directions for Artificial Intelligence (AI); Machine Learning (ML) and Deep Learning (DL)
- Hardware Accelerated Deep Learning instructions and implementations; DL Boost, VNNI instructions

13:30 – 11:00 Coffee break

11:00 – 12:30
Performance optimized Python
Hands-on Labs with Python focus on Classical Machine Learning examples and algorithms

12.30 – 14:00 Lunch break

14:00 – 17:00
Afternoon session: Optimized Deep Learning Frameworks
- Performance optimized Frameworks solutions from Intel; Tensorflow, Keras, Caffe, Pytorch, BigDL and others
- Performance acceleration with Intel MKL and Intel MKL-DNN for Deep Neural Network

15:30 – 16:00 Coffee break

16:00 – 17:00
Afternoon session: Distributed Deep Learning Solutions on HPC systems
- Accelerate Training and Inference of Distributed solutions on HPC (MPI) environments using Xeon (x86); Distributed Tensorflow with Horovod
  Distributed Machine Learning with Daal4py

FESTIVE CONFERENCE OPENING AND 25TH ANNIVERSARY CELEBRATION

Tuesday, 27.08.2019 – Evening

Location
Aula of Georg August Universtät Göttingen,
Wilhelmsplatz 1, 37073 Göttingen

From 18:45 Open doors

Event Anchor
Joe Pfändner
Georg-August-Universität Göttingen
English Philology Seminar

19:00 Beginning

Intro: Right now – Right here – Euro-Par
Realized by Heiko Siebert
Georg-August-Universität Göttingen, Theater im OP, Göttingen,

Opening of the conference and welcoming address
Ramin Yahyapour, CIO Georg-August-Universtät Göttingen, Managing Director GWDG, host and main organizer of Euro-Par 2019

Monkey's Daughter, Susanne Wieneke & Eduard Luszas, Göttingen: "God's best"

Greeting Uni, Georg-August-Universtät Göttingen
Norbert Lossau, Vice President for research and information infrastructure; Host of Euro-Par 2019

Greeting SUB – State and University Library, Göttingen
Frank Klaproth, Head of Department Digital Library
Host of Euro-Par 2019

Monkey's Daughter, Susanne Wieneke & Eduard Luszas, Göttingen: "Cat'n Mice"

Greeting Gauß-Allianz, Berlin (German competence network to support the scientific community in Germany by creating the conditions for sustainable and efficient use of supercomputing resources of the top performance classes)
Thomas Ludwig, Vice Chair, Steering Committee Gauß-Allianz

Monkey's Daughter, Susanne Wieneke & Eduard Luszas, Göttingen: "Seen the chances"

Celebrating 25 Years of Euro-Par
Christian Lengauer, University of Passau, Germany
Ron Perrott, Oxford e-Research Centre, UK
Honorable Members of Euro-Par
Paul Kelly, Imperial College, London, UK
Steering Committee Euro-Par

Monkey's Daughter, Susanne Wieneke & Eduard Luszas, Göttingen: "Happy Birthday Euro-Par"

Euro-Par 2019 – Short Overview
Important dates of Euro-Par 2019 and program highlights
Ramin Yahyapour, host and main organizer of Euro-Par 2019

Photo Session
Participants at the 25th Euro-Par 2019 in Göttingen

Reception
Location: Alte Mensa, Wilhemsplatz 1,
37073 Göttingen

CONFERENCE PROGRAMME

Wednesday, 28.08.2019

Location: Alte Mensa, Wilhelmsplatz 3, 37073 Göttingen

(1) Plenary Session

09:00 - 10:00	**Keynote 1** **Michela Taufer** University of Tennessee Knoxville *Scientific Applications and Heterogeneous Architectures – Data Analytics and the Intersection of HPC and Edge Computing*
10:00 - 10:30	*Coffee break*

(2) Parallel Sessions

	(2.1) Theory	(2.2) Programming
Location	Room 1, Ground Floor	Room 2, 1. Floor
Chair	**Andrey Chernykh, CICESE, Ensenada, B.C., Mexico**	**Cornelia Grabe, DLR, Göttingen, Germany**
10:30 - 11:00	Daniel Funke, Peter Sanders and Vincent Winkler *Load-Balancing for Parallel Delaunay Triangulations*	Dave Dice and Alex Kogan *TWA – Ticket Locks Augmented with a Waiting Array*
11:00 - 11:30	Blair Archibald, Patrick Maier, Robert Stewart and Phil Trinder *Implementing YewPar: a Framework for Parallel Tree Search*	Peter Thoman, Philip Salzmann, Biagio Cosenza and Thomas Fahringer *Celerity: High-level C++ for Accelerator Clusters*
11:30 - 12:00	Klaus Jansen and Malin Rau *Linear Time Algorithms for Multiple Cluster Scheduling and Multiple Strip Packing*	Vivek Kumar *Featherlight Speculative Task Parallelism*
12:00 - 12:30	Julian Oppermann, Patrick Sittel, Martin Kumm, Melanie Reuter-Oppermann, Andreas Koch and Oliver Sinnen *Design-Space Exploration with Multi-Objective Resource-Aware Modulo Scheduling*	Andres Tomas and Enrique S. Quintana-Orti *Cholesky and Gram-Schmidt Orthogonalization for Tall-and-Skinny QR Factorizations on Graphic Processors*
12:30 – 14:00	*Lunch break*	

(3) Parallel Sessions

Location	Room 1, Ground Floor	Room 2, 1. Floor
Chair	**Morris Riedel, Jülich Supercomputing Centre, Germany**	**Louis-Claude Canon, INRIA, Besançon Cedex, France**
	(3.1) Applications	(3.2) Tools
14:00 - 14:30	Rachid Guerraoui, Erwan Le Merrer, Rhicheek Patra and Jean-Ronan Vigouroux *Unified and Scalable Incremental Recommenders with Consumed Item Packs*	Mohammad Norouzi, Qamar Ilias, Ali Jannesari and Felix Wolf *Accelerating Data-Dependence Profiling with Static Hints*

14.30 - 15:00	Elnaz Azmi, Uwe Ehret, Jörg Meyer, Rik van Pruijssen, Achim Streit and Marcus Strobl *Clustering as Approximation Method to Optimize Hydrological Simulations*	Pierre Huchant, Emmanuelle Saillard, Denis Barthou and Patrick Carribault *Multi-Valued Expression Analysis for Collective Checking*
15:00 - 15:30	Valentina Avati, Milosz Blaszkiewicz, Enrico Bocchi, Luca Canali, Diogo Castro, Javier Cervantes, Leszek Grzanka, Enrico Guiraud, Jan Kaspar, Prasanth Kothuri, Massimo Lamanna, Maciej Malawski, Aleksandra Mnich, Jakub Moscicki, Shravan Murali, Danilo Piparo and Enric Tejedor *Declarative Big Data Analysis for High-Energy Physics: TOTEM Use Case*	Alessio Netti, Zeynep Kiziltan, Ozalp Babaoglu, Alina Sirbu, Andrea Bartolini and Andrea Borghesi *Online Fault Classification in HPC Systems through Machine Learning*

Change of Location: SUB – Historical Building, Papendiek 14, 37081 Göttingen

(4) Plenary Sessions	
Location	SUB/HG Alfred-Hessel-Saal
Chair	**Christian Boehme, GWDG, Göttingen**
16:00 - 17:00	**Vendor Talks** INTEL, DDN, Atos
17:00 - 18:30	**Student Poster Session**
Location	**SUB/HG Alfred-Hessel-Saal**
Chairs	**Luc Bougé**, IRISA, ENS Rennes and INRIA Rennes, France **Ramin Yahyapour, University of Göttingen and GWDG, Germany**

	HPC Bazaar
Location	SUB/HG Paulinerkirche
Event	**HPC in Germany**
	HLRN Mathias Läuter, HLRN Zuse Institute Berlin (ZIB), Germany
	Gauß-Allianz Jens Lukaschkowitz, Center of Information Services and High Performance Computing (ZIH), Dresden, Germany
	HPC Exibition – Back to the Future Christian Köhler, Simon Heider, Marcus V. Boden, GWDG, Göttingen, Germany
Event	**Practical course** in using the world's first electromagnetic telegraph. First steps in modern communications technology. Carl Friedrich Gauß, Wilhelm Weber, University of Göttingen, Germany
Event	**Exchange of Experiences** Georg Christoph Lichtenberg, Professor of Experimental Physics, University of Göttingen, Germany
Location	SUB/HG Atrium
	Refreshments at Picnic with Lichtenberg
18:45	**Discovering Göttingen**

Thursday, 29.08.2019

Location: Alte Mensa, Wilhelmsplatz 3, 37073 Göttingen

(5) Plenary Session	
09:00 – 10:00	**Keynote 2** **Rosa M. Badia** Barcelona Supercomputing Center *Complex workflows development in distributed computing infrastructures*
10:00 – 10:30	*Coffee break*

(6) Parallel Sessions		
Location	**Room 1, Ground Floor**	**Room 2, 1. Floor**
Chair	TBA	TBA
10:30 - 11:00	Kanat Tangwongsan and Srikanta Tirthapura *Parallel Streaming Random Sampling*	Thuy Linh Nguyen, Adrien Lebre and Ramon Nou *YOLO: Speeding up VM and Docker Boot Time by reducing I/O operations*
11:00 - 11:30	Louis-Claude Canon, Mohamad El Sayah and Pierre-Cyrille Héam *A Comparison of Random Task Graph Generation Methods for Scheduling Problems*	David Dice and Alex Kogan *Avoiding Scalability Collapse by Restricting Concurrency*
11:30 -12:00	Jordi Alcaraz, Anna Sikora and Eduardo Cesar *Code Region Characterization Using a Reduced Space of Hardware Counters*	Chih-Chieh Yang, Juan C. Pichel and David Padua *Dataflow Execution of Hierarchically Tiled Arrays*
12:00 - 12:30	Shu-Mei Tseng, Bogdan Nicolae, George Bosilca, Emmanuel Jeannot, Aparna Chandramowlishwaran and Franck Cappello *Towards Portable Online Prediction of Network Utilization using MPI-level Monitoring*	Sri Raj Paul, Akihiro Hayashi, Nicole Slattengren, Hemanth Kolla, Matthew Whitlock, Seonmyeong Bak, Keita Teranishi, Jackson Mayo and Vivek Sarkar *Enabling Resilience in Asynchronous Many-Task Programming Models*
12:30 – 14:00	*Lunch break*	

(7) Parallel Sessions		
Location	**Room 1, Ground Floor**	**Room 2, 1. Floor**
Chair	TBA	TBA
	(7.1) Chess Timer Talks	(7.2) Chess Timer Talks
14:00 - 14:45	Alexander van der Grinten, Eugenio Angriman and Henning Meyerhenke *Parallel Adaptive Sampling with almost no Synchronization*	Yohan Chatelain, Eric Petit, Pablo de Oliveira Castro, Ghislain Lartigue and David Defour *Automatic exploration of reduced floating-point representations in iterative methods*

14:45 - 15:30	Nikita Koval, Dan Alistarh and Roman Elizarov *Scalable FIFO Channels for Programming via Communicating Sequential Processes*	Navjot Kukreja, Jan Huckelheim, Mathias Louboutin, Paul Hovland and Gerard Gorman *Combining checkpointing and data compression to accelerate adjoint-based optimization problems*
15:30 - 16:00	*Coffee break*	

Location: University of Göttingen Aula, Wilhlemsplatz 1, 37073 Göttingen

(8) Plenary Sessions	
Chair	Ramin Yahyapour, GWDG, Göttingen, Germany
	(8.1) Distinguished Papers
16:00 - 16:45	Bram Veenboer and John W. Romein *Radio-Astronomical Imaging: FPGAs vs GPUs*
16:45 - 17.30	Arya Mazaheri, Johannes Schulte, Matthew Moskewicz, Felix Wolf and Ali Jannesari *Enhancing the Programmability and Performance Portability of GPU Tensor Operations*
	(8.2) Presentation Euro-Par 2020
17:30 - 17:45	Krzysztof Rządca, University of Warsaw, and Maciej Malawski, AGH University of Science and Technology, Kraków *Introduction of 26. Euro-Par in Warsaw, Poland*

Presentation of the Euro-Par Award 2019

Change of Location: Restaurant Bullerjahn in the historical town hall, Markt 9, Göttingen

from 19:30	*Conference Dinner*

Friday, 30.08.2019

Location: Alte Mensa, Wilhelmsplatz 3, 37073 Göttingen

(9) Plenary Session	
09:00 – 10:00	**Keynote 3** **Helmut Grubmüller** Max Planck Institute for Biophysical Chemistry, Göttingen and Georg August University Göttingen, Department of Physics *Nanomachines at Work: Atomistic Simulations of Biomolecular Systems*
10:00 – 10:30	*Coffee break*

(10) Parallel Sessions		
Location	Room 1, Ground Floor	Room 2, 1. Floor
Chair	**Andrey Chernykh, CICESE, Ensenada, B.C., Mexico**	**Barbara Chapman, Stony Brook, NY, USA**
10:30 - 11:00	Saurabh Kalikar and Rupesh Nasre *Contention-aware Task Scheduler for Concurrent Hierarchical Operations*	Jakub Kurzak, Mark Gates, Ali Charara, Asim Yarkhan, Ichitaro Yamazaki and Jack Dongarra *Linear Systems Solvers for Distributed Memory Machines with GPU Accelerators*
11:00 - 11:30	Massinissa Ait Aba, Guillaume Aupy and Alix Munier Kordon *Scheduling on Two Unbounded Resources with Communication Costs*	Meghana Aparna Sistla and V. Krishna Nandivada *Graph Coloring using GPUs*
11:30 - 12:00	Luis Santana, Daniel Cordeiro and Raphael De Camargo *PLB-HAC: Dynamic Load-Balancing for Heterogeneous Accelerator Clusters*	Fatih Ta yaran, Kerem Yıldırır, Kamer Kaya and Mustafa Kemal Ta *One Table to Count Them All: Parallel Frequency Estimation on Single-Board Computers*
12:00 - 12:30	Frederic Azevedo, Dalibor Klusacek and Frederic Suter *Improving Fairness in a Large Scale HTC System Through Workload Analysis and Simulation*	Jérôme Richard, Guillaume Latu, Julien Bigot and Thierry Gautier *Fine-grained MPI+OpenMP plasma simulations: communication overlap with dependent tasks*

(11) Plenary Session	
Location	Room 2, 1. Floor
Chair	**Luc Bougé, IRISA, ENS Rennes and INRIA Rennes, France** **Ramin Yahyapour, University of Göttingen and GWDG, Germany**
12:30 - 12:45	Look back, Feedback and Farewell
from 12:45	*Lunch break*

KEYNOTES AT EURO-PAR 2019

Keynote 1

Michela Taufer

Jack Dongarra Professor in High Performance Computing, Department of Electrical Engineering and Computer Science, The University of Tennessee Knoxville

Date: Wednesday 28.08.2019, 09:00 – 10:00
Location: Alte Mensa, Room 2 (Adam-v.-Trott-Saal)

Scientific Applications and Heterogeneous Architectures – Data Analytics and the Intersection of HPC and Edge Computing

Contact taufer@utk.edu
https://globalcomputing.group/about.html

Research Focus

Michela Taufer is an ACM Distinguished Scientist and holds the Jack Dongarra Professorship in High Performance Computing in the Department of Electrical Engineering and Computer Science at the University of Tennessee Knoxville (UTK). She has a long history of interdisciplinary work with scientists. Her research interests include software applications and their advance programmability in heterogeneous computing (i.e., multi-core platforms and GPUs); cloud computing and volunteer computing; and performance analysis, modeling and optimization of multi-scale applications. She has been serving as the principal investigator of several NSF collaborative projects. She also has significant experience in mentoring a diverse population of students on interdisciplinary research. Michela's training expertise includes efforts to spread high-performance computing participation in undergraduate education and research as well as efforts to increase the interest and participation of diverse populations in interdisciplinary studies.

Biography

Michela Taufer earned her undergraduate degrees in Computer Engineering from the University of Padova (Italy) and her doctoral degree in Computer Science from the Swiss Federal Institute of Technology or ETH (Switzerland). From 2003 to 2004 she was a La Jolla Interfaces in Science Training Program (LJIS) Postdoctoral Fellow at the University of California San Diego (UCSD) and The Scripps Research Institute (TSRI), where she worked on interdisciplinary projects in computer systems and computational chemistry.

Keynote 2

Rosa M. Badia

Workflows and Distributed Computing Group,
Department for Computer Science,
Barcelona Supercomputing Center

Date: Thursday 29.08.2019
Location: Alte Mensa, Room 2 (Adam-v.-Trott-Saal)

Complex workflows development in distributed computing infrastructures

Contact rosa.m.badia@bsc.es
https://www.bsc.es/badia-rosa-m

Research Focus

The group led by Dr. Badia has been developing the StarSs programming model for more than 10 years, with a high success in adoption by application developers. Currently the group focuses its efforts in PyCOMPSs/COMPSs, an instance of the programming model for distributed computing including Cloud. The group is extending the model to be able to consider edge devices that offload computing to the fog and to the cloud. Dr Badia has published

nearby 200 papers in international conferences and journals in the topics of her research. Her group is very active in projects funded by the European Commission and in contracts with industry.

Biography

Rosa M. Badia holds a PhD on Computer Science (1994) from the Technical University of Catalonia (UPC).
She is the manager of the Workflows and Distributed Computing research group at the Barcelona Supercomputing Center (BSC).
Her current research interest are programming models for complex platforms (from edge, fog, to Clouds and large HPC systems).

Keynote 3

Helmut Grubmüller

Department of Theoretical and Computational Biophysics, Max Planck Institute for Biophysical Chemistry, Göttingen and Georg August University Göttingen, Department of Physics

Date: Friday 30.08.2019, 09:00 – 10:00
Location: Alte Mensa, Room 2 (Adam-v.-Trott-Saal)

Nanomachines at Work: Atomistic Simulations of Biomolecular Systems

Contact hgrubmu@gwdg.de
https://www.mpibpc.mpg.de/grubmueller

Research Focus

Helmut Grubmüller's research aims at an understanding of the physics and function of proteins, protein complexes, and other biomolecular structures at the atomic level.
Questions addressed are:

- How do particular proteins perform their function?
- What is the underlying mechanism of these nano machines ?
- How can we theoretically describe these highly complex and irregular biomolecules as many-body-systems efficiently and properly?

For this purpose, complex computer simulations of the atomistic dynamics are carried out, and new statistical mechanics concepts and efficient parallel simulation algorithms and codes are being developed in Grubmüller's Department.

Biography

Helmut Grubmüller graduated in physics at TU Munich in 1990 followed by research stays at University of Illinois at Urbana-Champaign and CENG Grenoble in 1990 and 1991. In 1994 he obtained his PhD at the TU Munich. From 1994 until 1998 he was postdoctoral fellow at Univ. Munich, and in 1997 short term EMBO fellow at ETH Zurich. From 1998 until 2003 Helmut Grubmüller was head of an independent research group at the Planck Institute for Biophysical Chemistry, Göttingen. 2002 he habilitated in physics at the Georg August University Göttingen. Since 2003 he is Director at the Max Planck Institute for Biophysical Chemistry, Göttingen, and Scientific Member of the Max Planck Society. Since 2005 he is Honorary Professor of Physics at the Georg August University Göttingen.

Vendor Tracks at Euro-Par 2019

Edmund Preiss

Business Development Manager, EMEA;
Compute Performance Development Products Division

Software Development Tools for distributed and cross platform HPC environments

Intel has been in the business of supporting the software development for well more than a decade. The focus has been on supporting Intel CPUs such as

Xeon, ATOM, Core Architecture for Shared memory and Distributed memory (Cluster) systems.
This talk will describe the main upcoming enhancements of the *Intel Parallel Studio XE 2020 Editions
The speech will also touch very briefly on performance optimized *AI solutions* enhancing inference and training on distributed HPC systems supported by our tools and libraries which are part of the Intel tools suites. There is an Intel tutorial on Tuesday that dives into the details with technical labs.
Last but not least the presenter will address the latest planned developments of *_oneAPI_*, an open development toolkit addressing the needs to support one development environment
for various platforms ranging from CPUs, GPUs and FPGAs all the way to Accelerators

Biography

Edmund Preiss is a European Business Development Manager for Intel's Software Developer Tools, a position he has held for 11+ years. The Intel Tools products includes components such as Compilers, AI Frameworks, Libraries and Performance Analysis tools for R&D, HPC, academia, enterprise, manufacturing, automotive and machine/deep learning segments and applications.

Edmund Preiss joined Intel in 1988 and has since managed various product marketing, technical and business development programs/projects and teams.
He held several roles such as the Intel's European Strategic Software Planning within Intel's Software and Solutions Group and was the European channel marketing manager for Intel's Web Hosting Services (Intel Online Services).
He holds a Diploma of Electronic Engineering and brings with more than 35 years of Industry experience. Beside Intel he worked in the semiconductor business for the following companies: Siemens Semiconductor Components Division, Thomson Semiconductor and ST Microelectronics.

Atos

Unfortunately, no detailed information was available at the time of printing. Details will be published on the conference website at the daily program.

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Unfortunately, no detailed information was available at the time of printing. Details will be published on the conference website at the daily program.

Student Poster Session

Date: Wednesday 28.08.2019, 17:00 – 18:30
Location: SUB/HG, Paulinerkirche, 1. floor left
Chairs: **Luc Bougé and Ramin Yahyapour**

Mikhail Belonosov, Vladimir Tcheverda, Victor Kostin and Dmitry Neklyudov; *MPI+OpenMP parallelization for elastic wave simulation with an iterative solver*

Sreeram Sadasivam, Malin Ewering and Horst Schwichtenberg; *Abstract Decision Engine for Task Scheduling in Linux based Operating Systems*

Hajin Kim, Jiwon Bang, Siwoon Son, Namsoo Joo, Mi-Jung Choi and Yang-Sae Moon; *Message Latency-based Load Shedding Mechanism in Apache Kafka*

Siwoon Son and Yang-Sae Moon; *Duality-based Locality-Aware Stream Partitioning in Distributed Stream Processing Engines*

Gregor Ulm, Emil Gustavsson and Mats Jirstrand; *Active-Code Replacement in the OODIDA Data Analytics Platform*

Francisco Muñoz-Martínez, José L. Abellán and Manuel E. Acacio; *CNN-SIM: A Detailed Arquitectural Simulator of CNN Accelerators*

Hasan Heydari, Guthemberg Silvestre, Nicolas Larrieu and Alain Pirovano; *Time-based Consensus*

Cao Vien Phung, Jasenka Dizdarevic and Admela Jukan; *Enhancing Block-Wise Transfer with Network Coding in CoAP*

Michał Orzechowski, Bartosz Balis, Łukasz Dutka, Renata Słota and Jacek Kitowski; *Transparent data access for scientific workflows across clouds*

Andreas Grapentin and Andreas Polze; *A Classification of Resource Heterogeneity in Multiprocessing Systems*

HPC Bazaar

Date: Wednesday 28.08.2019, 17:00 – 18:30
Location:SUB/HG, Paulinerkirche, 1. floor left

Programme Overview

- HPC in Germany
  - HLRN
    Mathias Läuter, HLRN Zuse Institute Berlin (ZIB), Germany
  - Gauß-Allianz
    Jens Lukaschkowitz, Center of Information Services and High Performance Computing (ZIH), Dresden, Germany
  - HPC Exibition – Back to the Future
    Christian Köhler, Simon Heider, Marcus V. Boden, GWDG, Göttingen, Germany

- Practical course
  Using the world's first electromagnetic telegraph. First steps in modern communications technology.
  Carl Friedrich Gauß, Wilhelm Weber, University of Göttingen, Germany

- Exchange of Experiences
  Georg Christoph Lichtenberg, Professor of Experimental Physics, University of Göttingen, Germany

What is the HPC-Bazaar?

Martina Brücher and Christian Köhler, GWDG, eScience group, HPC Team, Göttingen, Germany

In order to provide an appealing platform for personal networking and informal exchange of information, the HPC Bazaar format has been added to the Euro-Par portfolio.

The HPC Bazaar takes place in parallel to the Student Poster Session in close distance. Like in a real bazaar you will find different "goods" as well as the possibility to take a snack or a – typical German – drink.

Because Euro-Par 2019 takes place in Germany, you can find at the Bazar mainly products of the category "HPC in Germany".

The Gauss-Allianz and the HLRN are represented with information booths. GWDG offers a short journey through time with exhibits from its computer museum and modern HPC technology from its business partners.

Well-known Göttingen scientists demonstrate the early beginnings of electronic data transmission and the basic understanding of electricity.

Instead of the regular coffee break in the afternoon, refreshments can be taken during the entire event session at the Picnic with Lichtenberg. Here is a marvellous opportunity for memorable photos of lasting value. Don't miss it.

The change to the Social Event is fluent.

Social Event – Discovering Göttingen

Date: Wednesday 28.08.2019, from 18:45
Location: SUB/HG, in front of main entrance

- Gauss in Göttingen – Great moments in mathematics
- City that creates knowledge – The history of the University of Göttingen
- Göttinger Messtechnikmeile – From Gauss to Measurement Valley
- Around the Gänseliesel – Göttingen history in a nutshell
- A Walk through Göttingen's Underworld – Secrets of Old vaulted Cellars

Duration: 1:30 – 2:00 hours

Presentation of this year's Euro-Par Award

Date: Thursday, 29.08.2019 – Evening

Conference Dinner

Date: Thursday, 29.08.2019, 19:30
Location: Restaurant Bullerjahn, in the historical town hall, Markt 9, 37073 Göttingen

Euro-Par is also known for its annual festive conference dinner at a place rich in tradition. This will also be the case in 2019. It will take place in the restaurant Bullerjahn in the historic town hall at the market place downtown the former Göttinger Ratskeller.

You're wondering: Who or what's a Bullerjahn?

Bullerjahn was a student tradition in Göttingen, named after the Göttingen musician Rudolf Bullerjahn. The Bullerjahn took place every week from around 1900 to the beginning of the 1970s in the Göttingen Ratskeller. The event was known far beyond Göttingen and was a great tourist attraction.

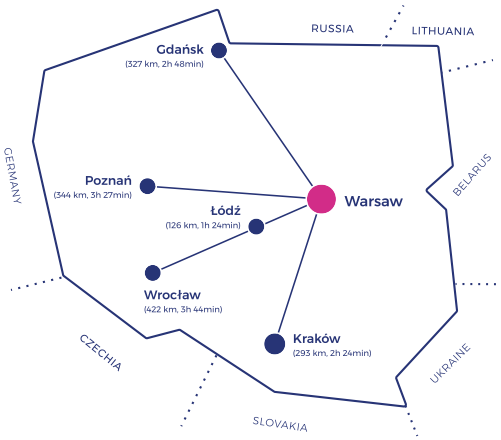
It had its origins in the competition of the orchestra oft he town of Göttingen under the direction of Rudolf Bullerjahn and the music band of the Infantry Regiment 82 under the direction of the "handsome Meyer" in the years 1886-1890.

Bullerjahn took place every Tuesday and Friday, in its final phase only on Fridays, in the Göttinger Ratskeller. The tables were full and every student fraternity had its place. Around midnight the first people present demanded the Bullerjahn. As a counter-reaction "Much too early" was always called out. Only after some time did the chapel, which had entertained the guests until then, let itself down to sing the Bullerjah song. The text of this song is very simple: "Director Bullerjahn, Bullerjahn is here! Director Bullerjahn, Bullerjahn, Director Bullerjahn is here! – Isn't that the handsome Meyer, yes, isn't it the handsome Meyer!" (Please consider: The beer was always very tasty in Göttingen and it was late …) Then followed various traditional German songs. But it also happened that songs were played for the individual groups. Around one o'clock the event was usually finished.

At the end of the 60's the Ratskeller was rebuilt and the Bullerjahn was lost. It still took place for some time in other restaurants, but did not reach the popularity as before and was finally discontinued. Various attempts to revive the event failed.

The Göttnger Ratskeller was renovated about 10 years ago. After renovation, modernisation and reopening in autumn 2010, the restaurant in historical town hall is named Bullerjahn.

OUTLOOK – EURO-PAR 2020



University of Warsaw, Poland
AGH University of Science and Technology, Kraków, Poland

We organize Euro-Par 2020 in Warsaw, Poland in cooperation between University of Warsaw (UW) and AGH University of Science and Technology (in Kraków), which are two premier computer science academic institutions in Poland.

Warsaw is the capital and the largest Polish city (around 2 million inhabitants), a major academic, industrial and cultural hub of Central and Eastern Europe. Warsaw is one of Europe's most dynamic metropolitan cities, leading Poland's 30 years of economic and cultural growth. Warsaw's main attractions include Old Town (UNESCO World Heritage), Łazienki — a royal park from 18th/19th century, Polin—Museum of the History of Polish Jews (2016 European Museum of the Year Award) and unique socialist-realism and socialist-modernist buildings from the 1950s and 1960s.

Warsaw has strong academic traditions and a lively student population of over 100,000.

Warsaw is an IT center of growing importance. Among others, Samsung and Google have R&D centers here. Local companies include CD Projekt (creators of The Witcher game series), 9LivesData (enterprise backup solutions), and Golem (Ethereum-based distributed computing service).

Warsaw is served by two international airports: the Warsaw Chopin Airport (WAW) with over 300 daily flights; and the Warsaw Modlin Airport (WMI), a Ryanair base with over 40 destinations. Warsaw has frequent and convenient train connections to Berlin and major Polish cities. We have a good public transport system with modern buses, trams and two metro lines. Our public bike system has over 5,000 bicycles available for short-term hire from over 350 stations.

We hope to host you next year!

Krzysztof Rządca

Maciej Malawski

EURO-PAR CONFERENCE 2020

PICTURE CREDITS

1 Aula with flags, Universität Göttingen, Bearbeitung Seitenplan Dortmund, Germany

2 Göttingen, Gebhardts Fotografie, Göttingen, Germany

4 Aula at University of Göttingen, Georg-August-Universität Göttingen / Kimmel, Göttingen Germany

5 University President Ulrike Beisiegel, Georg-August-Universität Göttingen, Germany

6 pixabay – Rudy and Peter Skitterians

7 Ramin Yahyapour, GWDG, Göttingen, Germany

8 SUB, Lower Saxony State and University Library, Lars Gerhardts, Göttingen, Germany

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13 Gauß-Allianz, Berlin Germany

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15 HLRN, Berlin, Germany und ZIB, Berlin GWDG

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17 Euro-Par Sterring Committe, Euro-Par 2017, Andrés Ruiz / CiTIUS, Santiago de Compostela, Spain

18/19 Privat, Lengauer, Passau, Germany
Euro-Par 2013, Aachen, Germany
Euro-Par 2006 Dresden, Germany

22/23 Katja Töpfer based on pixabay - Gerd Altmann

24 Katja Töpfer, based on the Covers oft he Euro-Par Proceedings designed by Springer Verlag GmbH, Heidelberg, Germany

25 Privat, Lengauer, Passau, Germany

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Euro-Par 2018, https://europar2018.org/cache/images/a/0/7/b/e/1b6dae3608c7b18feb-03b9197a0a458bcdb.jpeg

31 Privat, Lengauer, Passau, Germany

32 Privat, Lengauer, Passau, Germany

34 https://www.infosun.fim.uni-passau.de/cl/staff/lengauer/

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36 Campus Impressions, Georg-August-Universität Göttingen / Heller, Göttingen, Germany

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40 GWDG, Göttingen, Germany

41 Campus impressions with SUB New biulding, Georg-August-Universität Göttingen, Göttingen, Germany

Lichtenberg, SUB, Low- er Saxony State and University Library, Göttingen, Germany

53 pixabay - Marcus Weber, Austria

58 Bullerjahn, Göttingen, Germany

59 Michela Taufer, University of Tennessee Knoxville, USA

Rosa M. Badia, Barcelona Supercomputing Center, Spain

60 Helmut Grubmüller, Max Planck Institute for biophysical Chemistry, Göttingen, Germany

Edmund Preiss, INTEL

63 Manfred Eyßell, Von Leibniz zur Cloud, Göttingen 1999, page 5

64 Bullerjahn, Göttingen, Germany (both)
https://www.bullerjahn.info/wp-content/uploads/2014/07/Bullerjahn-4_1000x700.jpg

65 Map, Euro-Par 2020, Warsaw, Poland
Warsaw Tourist Organization archive, Poland

ACKNOWLEDGMENTS

Without the tremendous commitment of the GWDG staff and the public relations and event management teams of the Georg August Universität Göttingen and the SUB – Niedersächsische Staats- und Universitätsbibliothek the realisation of the Euro-Par would not have been possible.

Many thanks to the chairs and the contributors for their commitment, without which the scientific programme would not have been possible.

Thank you very much to Katja Töpfer, without her commitment the realization of this anniversary brochure would not have been possible.

Thank you to Catering-Haus Böning-Schaumberg, Rittmarshausen, Germany.

Thanks to Restaurant Bullerjahn for the preparation of a wonderful Conference Dinner

Thanks to the city of Göttingen for the use of public spaces.

Special thanks also go to the sponsors of Euro-Par 2019.

We thank our business partners Atos, DDN and INTEL for their financial support and contributions to the conference programme

and also SPRINGER which has been publishing the Proceedings of Euro-Par for 25 years now and grants free access to all ever published proceedings to participants of this year's conference in in addition their funding.

Göttingen, August 2019

Ramin Yahyapour

EURO-PAR
CONFERENCE 2019

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GEORG-AUGUST-UNIVERSITÄT
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