

Preface

ISC High Performance, formerly known as the International Supercomputing Conference, was founded in 1986 as the Supercomputer Seminar. Originally organized by Hans Meuer, Professor of Computer Science at the University of Mannheim and former director of the computer center, the seminar brought together a group of 81 scientists and industrial partners who all shared an interest in high-performance computing (HPC). Since then the annual conference has become a major international event within the HPC community, and accompanying its growth in size over the years, the conference has moved from Mannheim via Heidelberg, Dresden, Hamburg, and Leipzig to Frankfurt. With over 3,000 attendees in 2016, we were happy to see that this steady growth of interest also turned ISC High Performance 2017 into a powerful and memorable event.

In 2007, we decided to strengthen the scientific part of the conference by presenting selected talks on relevant research results within the HPC field. These research paper sessions began as a separate day preceding the conference, where slides and accompanying papers were made available via the conference website. The research paper sessions have since evolved into an integral part of the conference, and this year the scientific presentations took place over a period of three days.

For the past several years, the ISC High Performance conference has presented an ISC-sponsored award to encourage outstanding research in HPC and to honor the overall best research paper submitted to the conference. Two years ago, this annual award was renamed as the Hans Meuer Award in memory of the late Dr. Hans Meuer, general chair of the ISC conference from 1986 through 2014, and co-founder of the TOP500 project. From all research papers submitted, the Research Papers Program Committee nominated the two papers with the highest review scores as finalists for the award and, based on the final presentations during the conference, elected the best paper.

For ISC High Performance 2017, the call for participation was issued in Fall 2016, inviting researchers and developers to submit the latest results of their work to the Program Committee. In all, 66 papers were submitted from authors all over the world. This year, too, a significant effort was made to improve the overall process. The Research Papers Program committee consisted of 52 members selected from several countries throughout the world. Furthermore, 23 external expert reviewers were invited from the community to help with paper reviews of specific topics. After initial reviews were in place, a rebuttal process was organized in which authors were given an opportunity to respond to reviewers' questions and help clarify issues the reviewers might have. To come to a final consensus on the papers to be accepted, we had a face-to-face meeting where each paper was discussed. Finally, the committee selected 22 papers for publication and for presentation in the research paper sessions.

We are pleased to announce that many fascinating topics in HPC are covered by the proceedings. The papers address the following issues in regards to the development of an environment for exascale supercomputers:

- Cost-efficient data centers
- Scalable applications
- Advancements in algorithms
- Scientific libraries
- Programming models
- Architectures
- Performance models and analysis
- Automatic performance optimization
- Parallel I/O
- Energy efficiency

We believe that this selection is highly appealing across a number of specializations. Two award committees selected papers considered to be of exceptional quality and worthy of special recognition:

- The Hans Meuer Award honors the overall best research paper submitted to the conference. The two finalists for this award were:
 “Designing Dynamic and Adaptive MPI Point-to-point Communication Protocols for Efficient Overlap of Computation and Communication” by Sourav Chakraborty, Hari Subramoni, and Dhabaleswar Panda.
 “An Overview of MPI Characteristics of Exascale Proxy Applications” by Benjamin Klenk and Holger Fröning.
- The Gauss Centre for Supercomputing sponsors the Gauss Award. This award is assigned to the most outstanding paper in the field of scalable supercomputing and went to:
 “Diagnosing Performance Variations in HPC Applications Using Machine Learning” by Ozan Tuncer, Emre Ates, Yijia Zhang, Ata Turk, Jim Brandt, Vitus J. Leung, and Manuel Egele.

We would like to express our gratitude to all our colleagues for submitting papers to the ISC scientific sessions, as well as to the members of the Program Committee for organizing this year’s attractive program.

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