

# HPCS 2014 PREFACE

Welcome to Bologna, in the land of Italy, for this new edition of HPCS 2014. As in the previous editions of the conference, the HPCS community continues to consolidate, grow and get more and more active. This positive development is occurring despite a complicated reality the HPC domain is currently facing, spanning from technological challenges to areas such as software development programming models, to big data and new platforms opportunities, to the need to rethink the way to produce science in light of the data deluge. In the midst of these existing events, we have succeeded in putting together an interesting and representative program, in which the most advanced topics in high-performance, parallel and distributed computing, and simulation and modeling are covered.

We would like to express our great appreciation for the support that we have received from our sponsors and from the local authorities of the *City of Bologna*, which although could not be directly acting as a conference sponsor, yet provided a very important support in putting in place an interesting complementary program to welcome all the attendees in a very unique city in the world. Bologna is known for its history, its identity to be open mind to cultures and innovations. It is a cradle of the culture system by the mere presence of the oldest University in the world.

Very hearty thanks go to the Local Organizing Committee members of the CINECA system. They have managed to arrange for the details necessary to make this conference possible. We would also like to thank all the authors who submitted their papers. Without their valuable effort, this program would not have been possible. We would finally like to express our gratitude to the Program Committee members for their advice and experience in the scientific evaluation of the works presented at the conference. Last, but not least, big thanks go to all the attendees and in particular the keynote, plenary and tutorial speakers, the organizers of the different workshops and special sessions, and participants in panels and demos.

For us, being the General Co-Chairs, it has been a great honor and pleasure having had the responsibility to organize HPCS 2014 and the opportunity to work with Waleed Smari and Luca Spalazzi who have developed their role as Program Chairs with devotion and passion, motivating us to carry on with the conference.

We hope to see you all again at the HPCS 2015 conference.

Sanzio Bassini  
CINECA, Bologna, Italy

Mads Nygård  
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June 2014

# HPCS 2014 PROGRAM MESSAGE

On behalf of the Steering, Organizing and International Program Committees, we would like to welcome you to the 2014 International Conference on High Performance Computing and Simulation (HPCS 2014) held in Bologna, Italy, July 21 – July 25, 2014. This conference will provide a dynamic forum to address, explore, and exchange information, knowledge, and experiences in the state-of-the-art in high performance computing systems, their modelling and simulation, design and use, applications, and impact. HPCS brings together researchers, scientists, engineers, practitioners, educators, and students from many nations and backgrounds to exchange their insights, breakthroughs, and research results about aspects of these systems and their technologies; to discuss challenges encountered in government, industry, and academe; and to seek new and innovative solutions. Additionally, we hope that the conference will present opportunities for many open technical interchanges in individual and group settings on key technology issues and applications, during the conference and the potential for future collaborations among the participants afterwards.

Current research in university, industry and research laboratories provides a new generation of HPC systems that rely on clouds and grid concepts, reconfigurability, autonomicity and pervasiveness to create fully interconnected communities of interest and practice with decision quality information in compressed time cycles. Through modelling and simulation, knowledge sharing and discovery, and just-in-time global grid-based and cloud information processing, individuals and groups will work together and make better, not just faster, decisions, services and products. It is hoped that the technologies and research presented in HPCS meetings will address the foundations and developments upon which these next generation systems and applications will be built.

The conference this year consists of three keynote speeches and one plenary talk, seven tutorials, five invited presentations, eleven tracks (symposia, workshops and special sessions), four demos, a panel session, one posters and one work-in-progress sessions, twenty-eight technical sessions, one DDC session, several exhibits, eight breaks, and six social events.

This is the seventh year in a row that HPCS has its own proceedings volume. The Proceedings contains papers on many timely and emerging topics. We received a good number of submissions and the quality of the overall manuscripts pool was excellent. Out of the 46 countries presented, the top five countries with most submissions were: Italy with 20.99%, USA with 9.16%, France with 8.39%, followed by Germany, India and Spain tied at 6.11% each, and the United Kingdom with 4.58%. The program's technical papers represent works from academia, research laboratories, government, and industry.

More specifically, this proceedings contains 58 regular papers out of a total of 151 papers submitted to the main track, with an acceptance rate of 38.41%, along with seven Doctoral Dissertation Colloquium abstracts, three poster papers, four technical posters abstracts and two Industry posters abstracts. Each paper in the main track was assigned to five reviewers and the majority of authors received at least 4 substantive reviews back. Due to the TPC members' timely response, we were able to meet the deadlines we had planned for the main track, albeit with a short extension. For the tracks, we have a total of 64 papers accepted. Each of the symposia, workshops and special sessions handled their papers separately but maintained similar standards for paper evaluation and acceptance (a minimum of three reviewers per paper). Lastly, this volume has five invited manuscripts.

On behalf of the Steering, Organizing and Program Committees, we would like to thank the many people who helped make this conference successful. We thank all authors who submitted their work to HPCS 2014 and who are presenting in Bologna. Our excellent collections of papers and presentations were possible through the diligent work of the International Technical Program Committee. The ITPC members and reviewers did an exceptional job and we are grateful for their help in reviewing and evaluating the paper submissions. We would like to acknowledge the conference's three outstanding Keynote Speakers: Profs. Luca Benini, Geoffrey C. Fox, and Timothy Lanfear. Furthermore, we acknowledge the HPCS 2014 plenary and invited speakers: Profs. and Drs. Michael Mascagni, David R.C. Hill, Filippo Mantovani, Torsten Wilde, and Sonia Bergamaschi. The

conference this year has five workshops and six special sessions that were organized by professors and practitioners in their respective areas of expertise. We are very thankful for their efforts, dedication, and contributions. We keenly urge all participants to organize tracks in their area of interest in future meetings and thus grow the community. Additionally, the conference has seven excellent tutorials presented by Hesham Ali, Frédéric Loulergue, Julien Tesson, Michael Mascagni, Fabio Affinito, Francesco Salvatore, Krzysztof Benedyczak, and Kalyan S. Perumalla. We thank them all for their contributions. We also thank our panel organizers and panelists Sonia Bergamaschi, Carlo Cavazzoni, Alessandro Curioni, Geoffrey C. Fox, and Mads Nygård for their participation and contributions to the HPCS 2014 Panel Session. For the fourth time in HPCS history, this year we have a doctoral dissertation colloquium, with seven contributions. We hope that this session will continue to serve advanced graduate students and help them with their dissertation work as well as their careers. This year we also include four demos that we believe should be very interesting and timely. We acknowledge the demo authors and speakers and their contributions: Joel Falcou, Gabor Dozsa, S. Fiore, D. Elia, A. D'Anca, A. Mariello, C. Palazzo, P. Nassisi, G. Aloisio, Marc Baaden, Matthieu Dreher, Nicolas Ferey, Sébastien Limet, Jessica Prevotau-Jonquet, Bruno Raffin, Sophie Robert and Mikael Trellet. We continue to put together a good set of poster papers and poster presentations that we hope will contribute to some useful exchanges and live discussions. We thank all those who contributed to the Posters Session. We also thank our Social Events and Local Support co-chairs and members for providing exceptional assistance and dedication as well as putting together an interesting social program for the participants.

We appreciate the *In Technical Cooperation* status and support the conference has received from ACM SIGS, IEEE Italy Section, IEEE Computer Society - Italy Chapter, IEEE Computational Intelligence Society - Italian Chapter, IEEE Dayton Section, CINECA Supercomputing Consortium, and the University of Bologna. Last but not least, we wish to thank our sponsors and exhibitors: Altair, E4 Computer Engineering, Eurotech, Grid Telekom, HUAWEI Technologies Co., Ltd., IBM, Intel Corporation, Nice Software, Nvidia, PRACE, UnipolSai Assicurazioni, Yahoo! Corporation, EGI-InSPIRE, Springer Verlag, and John Wiley & Sons, Inc.. Their contributions and sponsorships made many activities possible and are very much appreciated.

We wish to thank our hosts and the Local Arrangements and Support Committee for the wonderful arrangements, assistance, and services they have provided. Specifically, we recognize the support of Sanzio Bassini, Francesca Garofalo, Claudio Sartori, Claudia Truini, Paola Alberigo, Giovanni Erbacci, Francesco Falciano, Carlo Cavazzoni, Claudio Arlandini and their entire team. We acknowledge and express our sincere appreciation to them for their hard work, support, and advice throughout the year, which made this conference a success and a reality.

We must also express our personal gratitude for the support, guidance, and encouragement we received from our Honorary General Co-Chairs and General Co-Chairs this year: Jean Gonnord, James Sexton, Mateo Valero, Mads Nygård, and Sanzio Bassini. In addition, we wish to thank all members of the Steering Committee, the Advisory Committee, and the Organizing Committee without whom this conference and program would not have been possible.

We thank all of our attendees for making HPCS 2014 an extraordinary and enjoyable event. We hope you find this year's conference stimulating and worthwhile and look forward to seeing you at HPCS 2015!

Waleed W. Smari and Luca Spalazzi  
HPCS 2014 Program Co-Chairs  
Dayton, Ohio, USA and Ancona, Italy  
June 2014