Preface

This volume contains the proceedings of the international HPCN Europe 2000 event which was held in the Science and Technology Centre Watergraafsmeer, Amsterdam, the Netherlands, May 8-10, 2000.

HPCN (*High Performance Computing and Networking*) Europe event was organized for the first time in 1993 in Amsterdam as the result of several initiatives in Europe, the United States of America, and Japan. Succeeding HPCN events were held in Munich (1994), Milan (1995), Brussels (1996), and Vienna (1997), returning to Amsterdam in 1998 to stay.

The HPCN event keeps growing and advancing every year, and this year the event consisted of the scientific conference, focused workshops, and several associated events. The plenary lectures were presented by six renowned speakers:

- Henk van der Vorst, University of Utrecht, The Netherlands: *Giant Eigenproblems within Reach*,
- Wolfgang Gentzsch, CTO, Gridware Inc., Germany: *The Information Power Grid is Changing our World*,
- Bernard Lecussan, SupAero and ONERA/CERT/DTIM, France: *Irregular Application Computations on a Cluster of Workstations*,
- Miguel Albrecht, European Southern Observatory, Garching, Germany: *Technologies for Mining Terabytes of Data*,
- Hans Meinhardt, Max-Planck-Institut, Germany: *The Algorithmic Beauty of Sea Shells*, and
- Ingo Augustin, CERN, Geneva, Switzerland: *Towards Multi-petabyte Storage Facilities*.

The conference consisted of parallel tracks presenting 52 selected papers, and one track presenting 25 posters. The areas covered in the conference include: Industrial and General End-User Applications of HPCN, Computational and Computer Sciences, and this year the scope of the conference was further expanded by an additional area to emphasize the information management aspects, and the importance of the web-based cooperative application infrastructures.

In the area of *Web-Based Cooperative Applications* presented papers addressed: virtual enterprises and laboratories, cooperation coordination, as well as advanced web-based tools for tele-working. The area of *Industrial and End-User Applications of HPCN* consisted of papers focused on parallelisation of industrial codes, data-mining, and network applications. The papers presented in the area of *Computational Science* were dedicated to problem solving environments, metacomputing issues, load balancing and partition techniques, and new parallel numerical algorithms. In the area of *Computer Science Research in HPCN* the

following subjects were presented: Java in HPC, cluster computing, monitoring and performance, as well as compilation and low-level algorithms.

The newly emerging domains and applications of HPCN were covered within five thematic workshops and three associated events. The *Java in High Performance Computing* workshop (chaired by Vladimir Getov) focused on the use of Java in simulations, distributed resource management, on-line processing, data-intensive applications, and other emerging research topics that combine distributed object technology with networking. The *LAWRA* workshop (chaired by Jerzy Waśniewski) is devoted to the new, recursive formulation of basic algorithms in numerical software packages. Recursion leads automatically to better utilization of memory, offers very concise program structures, and results in significant speedup on modern SMP processors. Several challenging requirements of the virtual laboratory environments such as the problem solving and computing issues, data mining, and the collaborative work in emerging scientific and engineering domains were addressed within the *Virtual Laboratory* workshop (chaired by Bob Hertzberger). The main goal of the *Cluster Computing* workshop (chaired by Mark Baker and Wolfgang Gentzsch) is to find out how clusters, built with commodity-off-the-shelf hardware components and free or commonly used software, may redefine the concept of high performance and availability computing. At the *EuroStore* workshop (chaired by Fabrizio Gagliardi) efficiency, reliability, and manageability of very large storage systems (Multi-PB) were discussed. These problems, being of great importance for industrial applications, have been observed in high energy physics.

The three associated events of the HPCN 2000 conference were: the MPR event – *Massive Parallel Computing* (organized by Job Kleuver), the NCF event – *Dutch Super Computing* (organized by Jaap Hollenberg), and the symposium on *Modeling and Simulation of Morphogenesis and Pattern Formation in Biology* (organized by Jaap Kaandorp). This symposium addresses the investigation of self-organization and emergent behavior in biological systems with particle-based techniques.

The conference proceedings reflect the state of the art in several main areas of research, within the wide spectrum of HPCN. It is worth mentioning that the deadline for contributed papers was January 18, 2000. All the accepted papers and posters, as well as a selection of some papers presented at the workshops, are included in the proceedings. We thank all contributors for their cooperation, and we are pleased to observe the high quality of the submitted contributions. The best conference papers will also be selected later for publication in a special issue of the North-Holland journal *Future Generation Computer Systems*.

The selection of papers for HPCN 2000 would not have been possible without the support and careful evaluation of all the submissions by the members of the HPCN 2000 program committee, and their associated reviewers. The organizing committee is grateful for all the invaluable suggestions and the cooperation that we received from the reviewers. Their help made it possible to get at least three referee reports for each paper.

We would like to express our high gratitude to the members of the local organizing committee and the conference secretariat. Our sincere thanks go to Lodewijk Bos and Rutger Hamelynck. We greatly appreciate all the personal efforts and dedication of Anne Frenkel for both creating the HPCN Europe web pages and helping with the organization of paper distribution and review results, and those of Berry van Halderen for both setting up the on-line paper submission software and preparing papers for the proceedings.

We would like to thank the computer support groups, the FdNWI faculty of the University of Amsterdam, headed by Gert Poletiek, for the electronic communication support, and SARA in Amsterdam, headed by Jaap Hollenberg, for the distribution of the program and participation calls for HPCN 2000.

The organizers acknowledge the support of the DUTCH HPCN foundation, and the help of the University of Amsterdam for making its facilities available for this event.

March 2000

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Workshop Chairs:

Mark Baker (Cluster Computing)
Fabrizio Gagliardi (Eurostore)
Vladimir S. Getov (Java in High Performance Computing)
Bob Hertzberger (Virtual Laboratory)
Jerzy Waśniewski (LAWRA - Linear Algebra with Recursive Algorithms)

Associated Event Chairs:

Jaap Kaandorp (Modeling and Simulation of Morphogenesis and Pattern Formation in Biology)
Job Kleuver (MPR - Massive Parallel Computing)
Jaap Hollenberg (NCF - Dutch Super Computing)

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