

PREFACE

This volume of *Computational Methods in Science and Technology* is a special issue published after the SGI User Group 2006 Technical Conference (SGIUG2006).

The SGI User Group (SGIUG) is an independent, worldwide community focused on sharing information and improving the technical productivity of SGI's high-performance computing (HPC), data storage, and visualization systems.

The SGIUG formed several Special Interest Groups (SIGs) covering various technical and organizational areas, such as: Visualization, Applications, Libraries and Benchmarking, Novel Computing Technologies, Altix and Linux, Storage and CXFS, Grids, Security, Networking, Origin and IRIX, User Services and Program. SIGs are chaired by elected experts from around the world.

This year's, fourth SGIUG conference was a five-day event organized by the group in Las Vegas, Nevada, USA.

The conference program included tutorials, general talks given by well recognized keynote speakers (including top SGI's and Intel's executives) and numerous presentations on specific topics including: storage, job scheduling, clusters and grids, performance analysis and optimization, HPC programming and many others.

While all the presentations were fine prepared and very informative, we are only able to mention a few here, such as Altix, CXFS and PBS Pro presentations from NASA Ames regarding their Columbia Supercluster, software development oriented talks by Intel, SGI and others covering compilers, MPI and optimization and research presentations about ocean modeling, network simulation and algorithms development.

In the broad picture, scalability is the most demanding challenge for the next generation HPC systems with a growing number of cores. Two contributions deal directly with scalability studies. Two articles indirectly have to do with scalability and present efforts on application performance tuning. Another one is related to better scaling by presenting a high performance MPI implementation.

Other contributions range from white papers on workflows and data grids, the description of a platform to manage operational risks in oil industry, a review on best practices in cluster management to high performance database requirements and solutions.

On the executive side we had amongst others, "The New SGI and the Voice of the Customer" by Dennis McKenna, new Chairman, CEO and President of SGI and visionary "Technology Trends" by famous Dr. Eng Lim Goh, SGI's Chief Technology Officer.

Finally, we had an excellent support coming from Silicon Graphics and its partners (Intel and others) that provided experts being able to support end users and their high throughput and high performance computing applications.

The conference brought together a diverse group of participants from the research, industry, academic and government sectors around the world to discuss the current state of the technology that allows us to work on some of the most challenging problems on the planet.

Selected articles from the conference and additionally some white papers submitted by SGI's top engineers are published in this book. **We would like to thank all the authors for their effort in preparing and presenting the high quality papers we can now share with you.** In particular, we gratefully acknowledge the support from SGI for the conference and their contributions to this book.

For more information, please visit SGIUG website www.sgiug.org or email us at: info@sgiug.org.

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