

# Preface

High performance scientific computing is an interdisciplinary area that combines many fields such as mathematics and computer science as well as scientific and engineering applications. It is an enabling technology for both competitiveness in industrialized countries and for speeding up development in emerging countries. High performance scientific computing develops methods for modeling, computer aided simulation and optimisation of complex systems and processes. In practical applications in industry and commerce, science and engineering, it helps to conserve resources, to avoid pollution, to reduce risks and costs, to improve product quality, to shorten development times or simply to operate systems better. Topical aspects of scientific computing have been presented and discussed at the Fifth International Conference on High Performance Scientific Computing that took place in Hanoi on March 5–9, 2012. The conference has been organized by the Institute of Mathematics of the Vietnam Academy of Science and Technology (VAST), the Interdisciplinary Center for Scientific Computing (IWR) of the University of Heidelberg, Ho Chi Minh City University of Technology, and the Vietnam Institute for Advanced Study in Mathematics.

More than 270 participants from countries all over the world attended the conference. The scientific program consisted of in total more than 190 talks, a big part of them presented in 19 mini-symposia. Eight talks were invited plenary lectures given by Frank Allgöwer (Stuttgart), Ralf Borndörfer (Berlin), Ingrid Daubechies (Durham), Mats Gyllenberg (Helsinki), Karl Kunisch (Graz), Volker Schulz (Trier) and Christoph Schwab (Zurich).

Topics included mathematical modeling, numerical simulation, methods for optimization and control, parallel computing, software development, applications of scientific computing in physics, mechanics and biomechanics, material science, hydrology, chemistry, biology, biotechnology, medicine, sports, psychology, transport, logistics, communication networks, scheduling, industry, business and finance.

This proceedings volume contains 21 carefully selected contributions referring to lectures presented at the conference. We would like to thank all authors and the referees.

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