

# RECENT DEVELOPMENT IN COMPUTATIONAL SCIENCE

Volume 2

Selected Papers  
from the International Symposium  
on Computational Science

*International Symposium on Computational Science*  
*Kanazawa University, Japan*  
*February 2011*

## Editors

R. Hertadi  
S. Miura  
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International Symposium on Computational Science 2011  
21-23 February 2011, Kanazawa University, Japan

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## Preface

The Fourth International Symposium on Computational Science (ISCS 2011) was held in Kanazawa, Japan, February 15-17 and continued and extended the traditions of previous conferences in the series: ISCS 2007 in Bandung, West Java, Indonesia; ISCS 2008 in Kanazawa, Japan; and ISCS 2009 in Sanur, Bali, Indonesia.

The tradition of ISCS springs from the fact that it was born from the cooperation between Bandung Institute of Technology, Indonesia, and Kanazawa University, Japan, on the enhancement of graduate students' education in the field of computational science and numerical mathematics. The aim of the symposium is to provide an occasion to present and exchange results and ideas related to these research fields not only for young researchers worldwide but also for senior professors and scientists.

This year's symposium was successful in the sense that more than 40 participants from 6 countries including several researchers from Bandung Institute of Technology and Kanazawa University joined the program. Moreover, 10 students participating in the Double-degree program between Kanazawa University and Bandung Institute of Technology also had a short talk and poster presentation about their research.

Topic areas of the symposium were very rich, ranging from applied and numerical mathematics and development of new algorithms in computational science, complex system modeling and simulation, computational chemistry, up to quantum and parallel computations. This highlighted the rapid development of computational science and the flourishing international cooperation. We would like to thank all the speakers for their inspiring talks.

From the submissions that ISCS 2011 received, 8 full papers were selected for this proceedings. The selected papers cover a wide variety of topics in Computational Science, such as advanced molecular dynamics computations, particle methods for fluid dynamics or simulation of crystals.

We would like to thank all symposium organizers and local organizing committee, including the staff and students of Department of Computational Science at Kanazawa University for the excellent work and support of ISCS 2011. We extend our thanks also to the main organizers of the symposium, namely the Department of Computational Science, Faculty of Science, Kanazawa University and the Faculty of Mathematics and Natural Sciences, Bandung Institute of Technology for their financial help and constant support in making ISCS 2011 a success. We owe special thanks to our sponsors: Fujitsu Limited and Japan Society for the Promotion of Science (Grant-in-Aid No. 21654013 represented by prof. S. Omata) for their generous support.

We invite you to visit the ISCS website (<http://iscs.cc>) to recount the events of the conference and to view the technical program dedicated to the fostering of Computational Science.

October 2011  
Editors