

## *Preface*

There is currently great interest in the study of spin-dependent transport phenomena, and novel many body effects, in high-mobility low-dimensional electron systems. In large part, this interest is motivated by the desire to exploit these phenomena in revolutionary technologies, such as quantum computing. As a contribution to the discussion in this important area, this volume contains the proceedings of the *Second Quantum-Transport Nano-Hana International Workshop (QTNH2004)*, on *Interacting Electron Systems in Quantum-Transport Devices*. The first workshop in this series (QTNH2001) was held at Chiba University on June 13, 2001, and focused on topics such as wavefunction scarring in open quantum dots, transport in coupled quantum dots, spintronics, and chaotic transport. It was attended by 66 participants from 8 different countries around the world, with 18 invited papers. Following up on the success of this workshop, QTNH2004 was held on March 24, 2004, and was focused on the topics of many-body phenomena in quantum point contacts, the Kondo and Fano effects in nanodevices, and chaotic and spin-related transport including carbon nano-tube devices. This workshop was attended by 70 participants from 8 different countries, with 11 invited papers presented at high quality oral sessions and 14 regular papers at a lively poster session. The present volume contains almost all the papers presented at the workshop.

On behalf of the many individuals involved in the organization of this workshop, we would like to thank the participants of QTNH2004, who contributed greatly to the technical depth of the workshop, as well as to the spirited discussions that were held throughout. We would also like to thank the many students from the Quantum Transport Materials Laboratory of Chiba University, for their invaluable assistance at the registration desk and with the local arrangements.

The organizers would particularly like to acknowledge the sources of financial support for the workshop. These organizations were Chiba University 21COE “Frontiers of Super-Functionality Organic Devices”, the Document Company FUJI XEROX, and the Chiba Convention Bureau. Without the generous support of these organizations, the workshop would not have been possible.

Yuichi Ochiai  
*Workshop Chair*

The Quantum-Transport Nano-Hana International Workshop (QTNH) chaired by Professor Ochiai covers research on various electronic and electrical properties of nano-scaled materials. The 21st Century Center-of-Excellence program, Frontiers of Super-Functionality Organic Devices, operated at Chiba University requires highly scientific research on quantum mechanical properties of organic semiconductors, which consist of  $\pi$ -electron molecular systems with dimensions less than the de Broglie wavelength of electrons. I believe, in this sense, that the papers presented at QTNH2004 held at Chiba University are strongly related to research in the 21st Century Center-of-Excellence program, and therefore it was our great pleasure to support QTNH2004.

Nobuo Ueno

*Leader of the 21st Century Center-of-Excellence program, Chiba University*

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