

## PREFACE

The International Workshop on Condensed Matter Theories is an annual Scientific meeting which has been hosted by prominent research institutions and universities in the Americas, Europe, and Asia. The Thirty-first Workshop of the series (CMT31) took place during 3–8 December 2007, in the **Chumpot-Pantip Conference Room, 4th floor, Prajadhipok-Ramphai Barni Building, Chulalongkorn University**, Bangkok, Thailand. The meeting was held under the joint sponsorship of Chulalongkorn University, The National Research Council of Thailand (NRCT), The Asia Pacific Center for Theoretical Physics (APCT), The Schwinger Foundation and U.S. Army Research Office.

The International Workshops on Condensed Matter Theories have a strong interdisciplinary tradition, in recognition of the commonality of problems faced by theorists and computational scientists when they seek fundamental and practical understanding of many-body systems in diverse areas of physics. Researchers working in the subfields of Solid-State, Soft-Matter, Low Temperature, Materials, Atomic, Nuclear, Particle, Statistical, Astrophysical, Chemical, and Biological Physics have gathered to share new concepts and strategies, as well as to present novel developments in analysis and computation. Over the years, the CMT Workshop Series has provided extraordinary opportunities for physicists from the full spectrum of nations to interact and learn from each other in a stimulating atmosphere of collegiality, often in exotic settings. The Series has been the origin of much fruitful international collaboration.

Fifty-six invited papers were presented, of which forty-eight appear as chapters in this volume. Reports of recent results generated lively debate on two-dimensional electron systems, the metal-insulator transition, dilute magnetic semiconductors, effects of disorder, magnetoresistance phenomena, ferromagnetic stripes, quantum Hall systems, strongly correlated Fermi systems, superconductivity, dilute fermionic and bosonic gases, nanostructured materials, plasma instabilities, quantum fluid mixtures, and helium in reduced geometries.

During the opening main session of the meeting, we took the opportunity to honor Charles Campbell's 65th Birthday and his outstanding research achievements and leadership within condensed matter physics, which received amply deserved recognition in his election to fellowship of the American Physical Society. Charles Campbell's knowledge and expertise extend over many areas of condensed matter physics and theoretical physics. He is a master of the synthesis of ideas and techniques drawn from diverse sources, and an articulate spokesman for the unity of physics. Blessed with extraordinarily acute physical intuition, he has developed

into one of the intellectual leaders of the subdiscipline of microscopic many-body theory. Complementing the breadth of his knowledge, there is clarity, depth, and solidity about his thinking that is a rare find. Running against the current trend, he is not one who simply grinds out results using some fashionable theoretical recipe. Rather, he is a true pioneer and innovator. The impact of his work on the present shape of *ab initio* many-body theory has been substantial; in fact it is abundantly clear that his contributions to correlated wave-function theories have been critical for the success that this approach has enjoyed since the 1970s.

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