

Preface

A school-type workshop entitled “Perspectives in Lattice QCD” was held from 31 October to 11 November 2005 at Nara International Seminar House, Nara, Japan. This is a part of activities of ILFT (International Lattice Field Theory) Network, which is a two-year research program sponsored by the Japan Society for Promotion of Science aiming at building and expanding a cooperative international framework in the lattice field theories among universities and research institutions in Japan, the US, Germany, Italy and the UK.

In the past decade the progress of simulation algorithms and the availability of more affluent computational resources have enabled us to investigate two- and three-flavor dynamical quark effects with lighter quark masses. A full QCD simulation with the physical up, down and strange quark masses are now getting into our view. On the other hand, theoretical understanding of the chiral fermion on the lattice has also developed remarkably since the early 90s. Although the dynamical quark simulation with the exact chiral symmetry is extremely demanding, some exploratory studies have already started. Under these circumstances, the workshop was intended to provide us an opportunity of systematic understanding of the recent progress in lattice QCD and basic grounds for thinking of the future direction. The lectures and seminars covers a wide range of subjects including forefront topics:

- Renormalization group and fixed point action,
- Algorithms in lattice QCD simulation,
- Lattice QCD with the domain decomposition algorithm,
- Chiral fermions on the lattice,
- Numerical simulation with the overlap fermion,
- On-shell improvement and nonperturbative renormalization,
- Twisted mass lattice QCD,
- Phenomenology with lattice QCD,
- Chiral perturbation theory.

They are delivered at an advanced level based on the lecturer's expertise in the subject. We would like to express our sincere gratitude to all the speakers for their excellent lectures and seminars. The written version of the lectures are collected in this volume, which is indebted to the efforts of the contributors.

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We hope this kind of school will be succeeded and contribute to the progress of the field in future.

Editor

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