

## PREFACE

This volume is based on the fourth international conference of quantum bio-informatics held at the QBI Center of Tokyo University of Sciences.

The purpose of the conference is towards new stage making interdisciplinary bridges in mathematics, physics, information and life sciences, in particular, research for new paradigm for information science and life science on the basis of quantum theory.

More than 100 researchers in various fields such as mathematics, physics, information and biology come from all over the world. The conference was held for nearly one week, and we had a lot of fruitful discussion. In this fourth conference, particular attention is come up on quantum entanglement, simulation of bio-systems, brain function, quantum like dynamics and adaptive systems. Most of speakers gave care to the relation between their own topics and the mystery of life.

The papers submitted in this volume are all referred, whose contents are related to one of the following subjects:

- (1) Mathematics of Cryptography and its related topics
- (2) Quantum algorithm and computation
- (3) Quantum entanglement
- (4) Quantum entropy and information dynamics
- (5) Quantum dynamics and time operator
- (6) Stochastic dynamics and white noise analysis
- (7) Brain activity
- (8) Quantum like models and PD game
- (9) Quantum physics and superconductivity
- (10) Quantum tomography and sufficiency
- (11) Adaptation in Plants
- (12) Alignment of sequences

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