Opening address

Ladies and Gentlemen;

Welcome to the RIKEN Symposium on "Large-Scale Calculation of Electronic States – Exploring Dynamical Properties of Materials" organized by Dr. Iitaka and other committee members.

In the 20^{th} century, physics has made great progress. However there remain still a lot of challenging important problems such as clarifying the mechanism of high-T_C superconductivity. Computational physics is promising in solving such difficult problems. Of course, experimental physics and theory are very useful in understanding the essential properties of physical phenomena. Then, what is the role of computational physics? A naive purpose of it is to explain experimental results theoretically. More ambitious task of it will be to predict new interesting physical phenomena and to extract universal physical properties from numerically calculated results in order to find basic physical laws behind them.

It is expedient for this purpose to discover new powerful methods and algorithms of numerical calculations. Up to now, the density functional theory, quantum Monte Carlo method, Car-Parrinello method and other have been used effectively. Among them, the density functional method is now recognized to be very useful for numerical calculations in physics and quantum chemistry. Walter Kohn received the Nobel prize for this great contribution. This is encouraging the people working in the field of computational physics.

In this symposium, we do hope to learn some remarkable new techniques and results on dynamical phenomena of classical and quantum systems. Furthermore, the presentation and discussion here will be expected to stimulate discovery of new approaches to important physical problems in condensed matter physics.

Thank you very much.

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