Report on the 2nd NTT Basic Research Laboratories School

With the aim of increasing the visibility of NTT Basic Research Laboratories to young overseas researchers, the 2nd NTT Basic Research Laboratories School was held from October 8 to 14, 2004 at the Fuji Training Institute, Fujiyoshida, Yamanashi prefecture and NTT Atsugi R&D Center.

1. Purpose

The mission of NTT Basic Research Laboratories (NTT-BRL) is to uncover new principles and develop new technologies in quantum information processing, nanotechnology, and the base field of materials physics. Under the theme of "Transport Properties in Quantum Nanostructures," the 2nd NTT Basic Research Laboratories School was held with the aim of training young researchers in the field of materials physics and exposing NTT-BRL to young overseas researchers [1]. A set of lectures was given mainly for overseas university students by well-known professors having a close relationship with NTT-BRL. Some of the lectures included descriptions of research activities at NTT-BRL. A total of 32 students from around the world (31 overseas students representing 17 countries and one Japanese student) participated (**Photo 1**).

2. Overview

2.1 Lectures

As part of the main program, two professors known for their world-class research achievements presented a series of lectures under the theme of "Transport Properties in Quantum Nanostructures." Professor Leonid Glazman, University of Minnesota, U.S.A, gave nine hours of consecutive lectures on the "Coulomb Blockade in Quantum Dots" dealing mostly with theoretical issues (**Photo 2**), while Professor Seigo Tarucha, University of Tokyo, Japan, lectured for six hours on "Electronic Properties of Semiconductor Nanostructures" from the experimental side. These lectures in the main program were followed by a set of lectures given by three well-known overseas and Japanese professors. Professor Rosario Fazio (Scuola Normale Superiore, Italy) lectured on "Quantum Dynamics of Superconducting Nanocircuits" (theory), Professor Christian Schönenberger (University of Basel, Switzerland) lectured on "Elec-

Photo 1. Group photograph of lecturers and participants.

Photo 2. Lecture by Professor Glazman.

tronic Properties of Carbon Nanotubes" (experimental), and Professor Tsuneya Ando (Tokyo Institute of Technology, Japan) lectured on the "Physics of Carbon Nanotubes" (theory).

2.2 Poster sessions by participants

Lectures were followed by evening poster sessions on October 9 and 10. Each of the 32 participating students gave a poster session to introduce his or her own research. The sessions were attended by Dr. Hideaki Takayanagi, Director of NTT-BRL, and by the executive manager of each research laboratory and various group leaders at NTT-BRL in addition to the students themselves and the lecturers. The students gave detailed descriptions of papers they had presented at international conferences and of their research work. Energetic and meaningful discussions on the material presented continued late into the night among the students, lecturers, and NTT researchers (**Photo 3**). On the final day of school sessions, four of the participants were given awards for poster sessions of exceptional quality (**Photo 4**). All of the participating students received NTT-BRL School completion certificates on the last day.

2.3 Laboratory tour

On the first day of the School, Dr. Takayanagi gave an overview of NTT-BRL to all the participants and described its mission and research system. On the last day, the executive managers of the Materials Science Laboratory, Physical Science Laboratory, and Optical Science Laboratory gave detailed introductions to these laboratories, and participants were given a laboratory tour to enable them to get a first-hand look. The tour included research facilities and equipment such as clean rooms, the low-temperature laboratory, optical-materials evaluation equipment, and superconducting thin-film crystal-growth equipment. Results achieved with these facilities were also described in the tour.

3. Impressions

Participants were given a chance to comment on their experiences via a questionnaire. Some typical statements were "very extensive, in-depth lectures," "I was able to learn much about the research activities of NTT-BRL and its amazing research facilities," and "became interested in working at NTT-BRL in the future." These responses show that the advanced research activities at NTT-BRL greatly impressed the participants and improved the visibility of NTT-BRL. NTT Basic Research Laboratories is sincerely committed to holding more meetings of the NTT-BRL School in future to further improve awareness of NTT-BRL among young researchers worldwide.

Reference

[1] http://www.brl.ntt.co.jp/event/brlschool2004/scene.html

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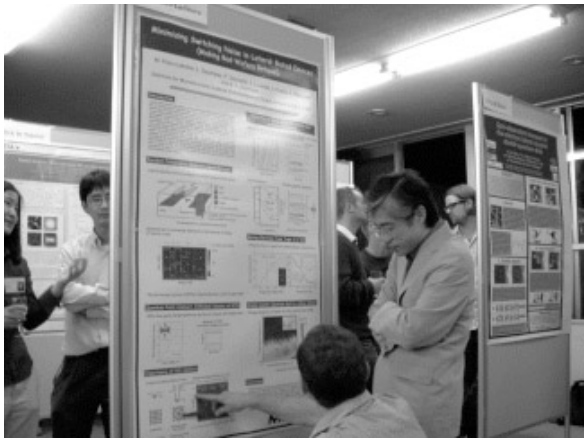

Photo 3. Poster sessions.

Photo 4. Presentation of poster awards and completion certificates.