External Awards

JSAP Outstanding Presentation Award

Winner: Nobuyuki Matsuda, NTT Basic Research Laboratories
Date: May 11, 2012
Organization: The Japan Society of Applied Physics (JSAP)

For "Integrated Polarization-entanglement Source on a Chip".

Quantum entanglement is a quintessential resource for quantum information systems, such as ones for quantum communication and quantum computation. A recent integrated-photonics approach for large-scale photonic quantum information processing provides a stable path length and a compact physical size. Since a number of quantum information protocols are based on the polarization degree of freedom, it is crucial to develop building blocks for generating, manipulating, and analyzing the polarization-entangled states of photons on a chip. Here, we report an integrated waveguide source that *generates* photon polarization entanglement for the first time. By using silicon photonics technology developed for on-chip optical interconnections, we monolithically implemented the polarization-entanglement source on a silicon chip.

Poster Awards for Both Excellent Poster Presentation and Poster Preview Presentation at International Conference on Topological Quantum Phenomena

Winner: Hiroshi Irie, NTT Basic Research Laboratories
Date: May 20, 2012
Organization: Organization Committee of TQP2012

For "Josephson Characteristics of Superconducting Quantum Point Contact".

A superconducting quantum point contact (SQPC) is a Josephson junction consisting of a semiconductor quantum point contact (semiconductor QPC) embedded in a narrow gap between two superconducting electrodes. It has been theoretically demonstrated that the critical current in an SQPC shows a steplike variation, reminiscent of the conductance quantization in a semiconductor QPC. Early experimental effort partly demonstrated such discretization of the critical current, although the visibility of the stepwise change was low and the study was limited to the multichannel regime because of the inferior gating properties of QPCs. In this study, we improved gate controllability, which resulted in an unambiguous demonstration of the discretization for the first time.