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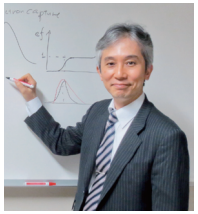
Front-line Researchers

Akira Fujiwara, Senior Distinguished Researcher, NTT Basic Research Laboratories

▼Overview

Semiconductor technology—the backbone of information and communication technology—has made amazing progress over the years, and more recently, attention has come to focus on the ultimate-level control of single electrons and single atoms using nanofabrication and crystal-growth techniques. What kind of breakthroughs can we expect from NTT's research on ultimate electronics? We asked Dr. Akira Fujiwara, Senior Distinguished Researcher at NTT Basic Research Laboratories, to update us on recent research achievements and to tell us about his life as a researcher.

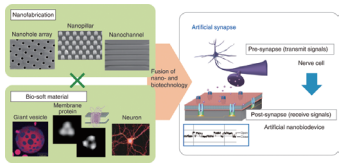


Feature Articles
Forefront Research on Bio-soft Materials

Overview of Bio-soft Material Research at NTT

▼Abstract

At NTT Basic Research Laboratories, we are aiming to create a novel nanobiointerface that allows direct access to the human body and brain by utilizing the functions and structures of biomolecules and soft materials. We are also attempting to understand the fundamental principles of bioinformation processing by managing the combination of nanotechnology and biotechnology. The Feature Articles in this issue introduce our bio-soft material research in relation to the fabrication of nanobiodevices, which constitute one of the components of a future artificial synapse. We also present a highly sensitive and long-term stable biosensing system.

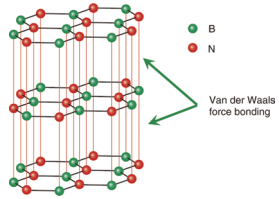


Regular Articles

Substrate-transfer Technique Using h-BN for GaN-based High-power Transistors

▼Abstract

We transferred AlGaN/GaN (aluminum gallium nitride/gallium nitride) high electron mobility transistors from a sapphire substrate to a material with high thermal conductivity using a substratetransfer technique that involves the use of an h-BN (hexagonal boron nitride) release layer. We succeeded in suppressing the self-heating effect and obtained good power performance in direct current characteristics. The transfer technique can overcome thermal problems in power transistors.



Path Accommodation Design Engine for Simply and Reliably Designing Multi-layer Transport Networks

▼Abstract

Core and metro transport networks continue to be simplified with the adoption of 100-Gbit/s packet transport systems. In line with this, the engineering work involved in path accommodation design and management is being carried out as a smooth flow, which is referred to as creating a flow-through operation. This article describes a multi-layer transport path accommodation design engine that takes into account the reliability demanded by each service in order to accommodate optical and multigranular electrical paths from a few megabits per second to 100 Gbit/s.