



Front-line Researchers

- ▶ Norio Kumada, Senior Distinguished Researcher, NTT Basic Research Laboratories

Rising Researchers

- ▶ Katsuhiko Nishiguchi, Distinguished Researcher, NTT Basic Research Laboratories

Feature Articles

Frontlines of IOWN Development—Development of IOWN Hardware and Software and Social Implementation Activities

- ▶ Development and Demonstration of Use Cases for Social Implementation of IOWN
- ▶ Development of Device Technology for IOWN Implementation
- ▶ Efforts to Develop Network Technologies for Practical Application of IOWN
- ▶ Data-centric Infrastructure for Enabling Practical Use of IOWN

Global Standardization Activities

- ▶ Standardization of Codec for Immersive Voice and Audio Services (IVAS) at 3GPP

Front-line Researchers

Norio Kumada, Senior Distinguished Researcher, NTT Basic Research Laboratories

▼ Abstract

Most active devices, such as transistors and photodetectors, currently used in information communications are based on semiconductors. Since the successful isolation of graphene in 2004, atomic-layer materials consisting of a single layer of atoms have attracted increasing attention. A variety of new materials have been discovered, along with novel phenomena and properties, paving the way for the development of next-generation devices that apply these unique properties. We spoke with Norio Kumada, a senior distinguished researcher at NTT Basic Research Laboratories, who is investigating the fundamental understanding and functional exploration of carrier dynamics in atomic-layer materials. We asked him about the results of his research, which aims to produce ultrafast devices by understanding the relationship between combinations of atomic-layer materials and their performance, as well as the enjoyment of the research process.



Rising Researchers

Katsuhiko Nishiguchi, Distinguished Researcher, NTT Basic Research Laboratories

▼ Abstract

Semiconductors are used in many familiar electrical appliances such as televisions, personal computers, and smartphones. As a semiconductor device, a transistor plays important roles such as amplifying and switching electrical signals. Artificial intelligence (AI), which has been attracting much attention, requires highspeed processing, which is contributing to a dramatic improvement in semiconductor performance. However, the development of new technologies and services based on AI requires huge amounts of electricity, so new measures to reduce power consumption and ensure future sustainable development are necessary. We spoke with Katsuhiko Nishiguchi, a distinguished researcher at NTT Basic Research Laboratories who has created the world's only transistor that can control a single electron at room temperature and is aiming to pioneer revolutionary technology to reduce the power consumption of semiconductors.



Feature Articles

Frontlines of IOWN Development—Development of IOWN Hardware and Software and Social Implementation Activities

Development and Demonstration of Use Cases for Social Implementation of IOWN

▼ Abstract

This article introduces the initiatives of NTT IOWN Product Design Center, which is promoting the development and demonstration of use cases leveraging Innovative Optical and Wireless Network (IOWN) technologies, with the goal of accelerating the implementation of the IOWN concept.

