

### New Value Creation in Photonic Technology

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Progress in establishing a high-speed Internet environment through ADSL<sup>\*1</sup>, FTTH<sup>\*2</sup>, and other schemes is continuing in the world of information communications. The rapid transmission of large volumes of data, the availability of always-on network connections, and the use of the Internet via cellular phones and information appliances are fast becoming possible. At NTT, we have formulated a plan called “HIKARI Vision—Toward the World of Resonant Communication through Broadband” (*hikari* is the Japanese word for light). This plan reflects our mission of creating a true broadband and ubiquitous era through photonics.

The networks for this broadband/ubiquitous era will be based on optical communication. This technology has been advancing steadily in parallel with the development of photonic devices. It includes optical fiber that carries light over long distances, semiconductor lasers that generate many optical signals at high speed, optical receivers that detect high-speed optical signals, and optical circuit components that combine/split optical signals. The laying of optical fiber started with the trunk network and is now reaching individual homes, enabling users to exchange large volumes of data. We expect this maturing of optical technology to accelerate price competition in photonic devices and promote the creation of new value-added optical-component technologies.

Various researchers have different outlooks on these technologies. Some pursue truth in nature. Others are pleased when the technology they developed provides practical services. Still others want substantial monetary compensation for their inventions. These goals are all important and necessary in research laboratories. However, more important considerations are: What will this technology be useful for? What will the benefits be? Have market and customer needs been considered? How much market share can we get?

Our research results are expected to produce huge benefits in corporate laboratories. Four key factors in creating a new business model for generating revenue

are: (1) integration of multi-disciplinary approaches, (2) value proposition (3) new value creation, and (4) cooperation with partners. We first need to understand the market and customer needs and propose and create value based on research results and intellectual property rights. Brainstorming with our partners will be necessary to generate proposals for new value. We need to repeat this process and progress towards new value creation to make a new business model.

Against this background, we at NTT Photonics Laboratories are researching and developing innovative photonic devices to create new value in communication networks. These R&D efforts are centered on the three technological pillars of optical semiconductors, planar lightwave circuits (PLC), and ultra-high-speed electronic circuits and devices. In addition, our target field for these photonic devices is not limited to optical communications. We are simultaneously pursuing their application to biotechnology, medical care, and other fields, and we expect to supply them to the global market through technology transfer and product development. NTT Photonics Laboratories aims to contribute to the creation of the next-generation information-sharing society through these various R&D activities.

\*1 ADSL: asymmetric digital subscriber line

\*2 FTTH: fiber to the home

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