OKI and Fraunhofer HHI Sign Comprehensive Joint Research Agreement to Pioneer Innovative Photonic Technologies

In front of the Fraunhofer HHI headquarters during the visit: Yoichi Kato, Senior Vice President of OKI (left), and Prof. Martin Schell, Executive Director of Fraunhofer HHI (right)
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Berlin, Germany / Tokyo, Japan, January 28th, 2026 – Oki Electric Industry Co., Ltd. (OKI), a leading Japanese information and telecommunications manufacturer, and Fraunhofer Heinrich-Hertz-Institut (Fraunhofer HHI), a leading German research institute in photonics, have announced the signing of a five-year comprehensive joint research agreement on advanced photonic technologies.

Through this partnership, the two organizations will develop world-class photonic technologies that are ultra-compact, high-performance, and energy-efficient, focusing on optical sensing and optical communications. Their aim is to provide solutions for diverse societal challenges, including infrastructure monitoring, healthcare, and the growing demand for internet communication capacity.

Background of the Joint Research

OKI, in its Technology Strategy announced in November 2023, proposed the Edge Platform concept as a solution platform to swiftly address social challenges.

Photonic technology serves as a core technology for various optical sensors and optical communications at the edge, and OKI has been focusing on the development of silicon photonics technology to achieve miniaturization of these modules. To further realize smaller size and lower power consumption, OKI has agreed with Fraunhofer HHI to jointly develop a module that combines OKI's silicon photonics integrated circuits and HHI's photonic integrated circuits using HHI's proprietary hybrid photonic integration technology. Resulting photonic technologies are expected to advance green transformation to achieve a sustainable society.

Outline of the Joint Research

Over the next five years, OKI and Fraunhofer HHI have agreed to jointly work on the creation of several innovative photonic technologies as well as the development of value chains for mass production. Initially, the partnership will focus on integrating OKI's expertise in silicon photonics with HHI's advanced hybrid photonic integrated circuit and packaging technologies.

The goal is to realize industry-leading, ultra-compact, and high-performance multi-chip integrated photonic devices and to develop various types of modules. Resulting modules, such as optical sensors and optical communication transceivers, are expected to provide effective solutions to global social issues. To facilitate the collaboration, OKI will dispatch researchers to Fraunhofer HHI's institute in Berlin.

Technological Overview and Social Impact

The optical sensors and communication transceivers to be jointly developed by OKI and Fraunhofer HHI will achieve world-class performance with unprecedented miniaturization. Planned developments in the field of optical sensors include laser vibrometers, fiber optic sensors, and optical biosensors.

Ultra-compact laser vibrometers will enable the detection of abnormalities by non-contact vibration measurement in automotive and electronics manufacturing lines, as well as in infrastructure such as bridges, tunnels, and buildings. Ultra-compact fiber optic sensors will provide structural health monitoring by detecting signs of mechanical strain or damage in infrastructure, aircraft, and rockets. In addition, compact optical biosensors are expected to enable the inspection of large numbers of samples simultaneously at low cost. For next-generation optical access networks, the partners also plan to develop ultra-compact optical transceivers capable of high-speed communication at 100 Gbps and above with low power consumption. Such transceivers will contribute to ever-increasing communication capacity demand while reducing energy consumption in rapidly expanding sectors such as the internet, data centers, and mobile communications.

Comments from Company Representatives and Future Outlook

Yoichi Kato, Director and Senior Vice President, Chief Technology Officer, and Head of Technology Division at OKI stated, “OKI has long been engaged in research and development of photonic technologies, with successful commercialization in fields such as communications, infrastructure monitoring, and defense. We have been intensively working on the research and development in silicon photonics. By combining our strengths with Fraunhofer HHI’s advanced photonic technologies, we are confident that we can realize world-leading technologies.”

“Fraunhofer HHI is a world-leader in photonic integrated circuits (PICs) for communication and sensing applications,” said **Prof. Martin Schell, Executive Director of Fraunhofer HHI**. “Our work helps to increase energy efficiency to address the demands of future-oriented markets. We are proud to be selected as an R&D Partner by a company as reputable and technologically excellent as OKI.”

Through this joint research, OKI and Fraunhofer HHI aim to accelerate the development of photonic technologies with the goal of commercializing ultra-compact laser vibrometers, fiber optic sensors, high-sensitivity optical biosensors, and ultra-compact, energy-efficient optical communication transceivers from 2027 onward.

[Related Links]

OKI Establishes OKI Berlin Lab R&D Center in Berlin, Germany:

https://www.oki.com/global/press/2025/06/z25009e.html

OKI Develops Ultracompact Photonic Integrated Circuit Chip Using Silicon Photonics Technology to Realize Various Optical Sensors:

https://www.oki.com/global/press/2024/11/z24041e.html

OKI Group’s Technology Strategy:

https://www.oki.com/global/assets_c/uploads/1116_3.pdf

About Oki Electric Industry (OKI)

Founded in 1881, OKI is Japan's leading information and telecommunication manufacturer. Headquartered in Tokyo, Japan, OKI provides top-quality products, technologies, and solutions to customers through its Public Solutions, Enterprise Solutions, Component Products, and Electronics Manufacturing Services businesses. Its various business divisions function synergistically to bring to market exciting new products and technologies that meet a wide range of customer needs in various sectors. Visit OKI's global website at https://www.oki.com/global/.

About Fraunhofer HHI

Fraunhofer Heinrich Hertz Institute is a world-leading research institute shaping the digital future. It pioneers innovative technologies at the forefront of materials science, communications, and photonic integration, supporting global connectivity and smart infrastructure. Fraunhofer HHI delivers practical solutions across diverse fields, including medicine, agriculture, critical infrastructure, disaster response, energy, and mobility. Visit Fraunhofer HHI at https://www.hhi.fraunhofer.de/en.

Notes:

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