

Press Release

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Leibniz Institute
for High
Performance
Microelectronics

IHP and Nagoya University, Japan, jointly develop next-generation semiconductor technologies

Frankfurt (Oder). IHP - Leibniz Institute for High Performance Microelectronics has been working closely with the University of Nagoya, Japan, for many years. The partnership involves research collaboration in the fields of silicon germanium epitaxy (SiGe), nanotechnology and advanced semiconductor and optoelectronic devices. In addition to research into new semiconductor technologies, the partnership includes an intensive exchange of scientists and students to share knowledge and experience.

The partners are developing new epitaxy techniques and methods for optimizing semiconductor interfaces to enable miniaturization of electronic devices. One of the key elements is the study of SiGe epitaxy processes using the IHP technology platform. The properties of silicon-germanium nanowires and nanodots are being investigated for use in energy-efficient silicon-based transistors and lasers. Other research topics include the luminescence properties of Si and Ge nanostructures and innovative solutions for sub-10 nm technology.

"We are very excited about this collaboration as it allows us to mutually benefit from the unique resources and experience of both parties. The future of microelectronics and silicon photonics is driven by such international partnerships," says Prof. Dr. Andreas Mai, Head of IHP's Technology Department. Dr. Yuji Yamamoto, project leader at IHP, adds: "Our research on SiGe nanostructure epitaxy enables the development of energy-efficient transistors and light sources that can revolutionize both quantum electronics and optoelectronics".

The cooperation with Nagoya University also includes an intensive academic exchange. Every year, PhD students and undergraduates from Japan visit IHP for research stays and internships, gaining valuable experience and participating in innovative projects. Conversely, IHP researchers participate in research at Nagoya University, using its unique infrastructure for semiconductor development. The mutual exchange of knowledge and research staff has resulted in numerous publications and presentations at prestigious international conferences (e.g. ISTDM, SSDM).

An important step in the strengthening of the collaboration was the appointment of Dr. Yuji Yamamoto from IHP as a Visiting Professor at Nagoya University, further strengthening the academic exchange between the institutions, where Dr. Yamamoto will support the development of young scientists and teach courses in semiconductor technology. Dr. Yamamoto is pushing the development of SiGe epitaxy at IHP and is highly recognized in the international community. In addition to developing many high-end SiGe devices (HBTs, photodiodes, etc.), he has made significant contributions to process development and has continuously explored new topics and advanced devices in sub-10nm technologies.

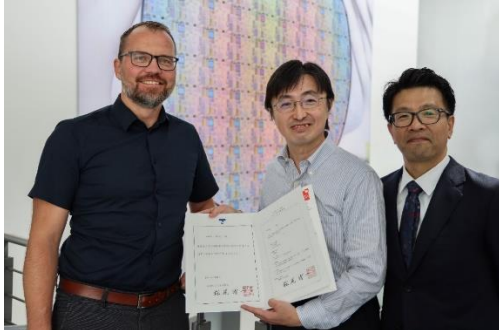
In the future, an even closer cooperation between IHP and Nagoya University is planned to enable new insights in the fields of epitaxy, quantum devices and optoelectronics. New project activities will be carried out, including the ones within the framework of ASPIRE



Press Release



(Adopting Sustainable Partnerships for Innovative Research Ecosystem) initiative. Research will focus on advanced semiconductor materials and their applications in telecommunications and sensor technologies.



Dr. Yuji Yamamoto from IHP
appointed as a Visiting Professor
at Nagoya University. ©IHP

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Contact:

Dr. Anna Sojka-Piotrowska
Marketing and Strategy
IHP GmbH – Leibniz Institute for High Performance Microelectronics/
Leibniz-Institut für innovative Mikroelektronik
Im Technologiepark 25
15236 Frankfurt (Oder)
Fon: +49 335 5625 409
E-Mail: sojka@ihp-microelectronics.com

About IHP:

The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultrahigh frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. The IHP employs approximately 365 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 μm SiGe BiCMOS technologies, located in a 1500 m² DIN EN ISO 14644-1 3 certified clean room.

www.ihp-microelectronics.com

