

FutureHorizons



The Global Semiconductor Industry Analysts

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Edge Computing, AI, and the Cloud

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Applied Materials, IME Extend Hybrid Bonding Research

Applied Materials and the Institute of Microelectronics (IME) have signed a five-year extension of their partnership focused on heterogenous chip integration research. The extension would continue R&D projects aimed at accelerating advances in hybrid bonding materials, equipment and process technologies.

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Arm CPUs Make Gains in Data Centers

Demand among cloud service providers along with ongoing chip shortages helped boost shipments of Arm-based servers during the third quarter. Five percent of servers shipped to cloud providers during the July-September period contained an Arm CPU, according to market tracker Omdia.

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TALK TO US



Optical Chip Solves Hardest Math Problems Faster than GPUs

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EVENTS

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STMicroelectronics unveils PowerGaN product family

STMicroelectronics has unveiled its first devices in the new PowerGaN product family as part of its STPOWER portfolio. Designed to enable more energy-efficient and slimmer power supplies, the new PowerGaN power semiconductor's target applications include consumer equipment such as chargers, external power adapters for PCs, LED-lighting drivers, and power supplies for televisions and home appliances.

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Edge Computing, AI, and the Cloud

There is certainly a buzz around the idea of digitalization—for its ability to deliver the benefits offered by greater visualization and analysis of data and to gain a greater understanding of the root causes of unexpected downtime and production bottlenecks. But what are the options, and how can they best be employed?

One benefit of digitalization—in addition to offering greater connectivity of devices at plant level—is its potential to escalate data to other systems and to make it possible to monitor plants remotely, in more depth, and over wider distances and longer periods than has been possible in the past.

Applied Materials, IME Extend Hybrid Bonding Research

Applied Materials and the Institute of Microelectronics (IME) have signed a five-year extension of their partnership focused on heterogenous chip integration research. The extension would continue R&D projects aimed at accelerating advances in hybrid bonding materials, equipment and process technologies.

In 2011, Applied Materials and IME, part of Singapore's Agency for Science, Technology and Research, established their first joint Center of Excellence in Advanced Packaging. The Singapore-based lab initially focused on 3D chip packaging and fan-out, wafer-level packaging during its first five-year agreement in 2016.

Arm CPUs Make Gains in Data Centers

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Five percent of servers shipped to cloud providers during the July-September period contained an Arm CPU, according to market tracker Omdia. Amazon Web Service's Arm-based Graviton processor contributed to the surge. Ampere Computing, another vendor offering Arm processors, also saw strong demand from cloud customers such as Equinix and Oracle.

Meanwhile, China's Huawei stepped up cloud server deployments of its Kunpeng CPU based on the Arm architecture, Omdia reported.

Optical Chip Solves Hardest Math Problems Faster than GPUs

Optical computing startup Lightelligence has demonstrated a silicon photonics accelerator running the Ising problem more than 100 times faster than a typical GPU setup.

Lightelligence's photonic arithmetic computing engine, known as Pace, is an integrated optical computing system consisting of about 12,000 photonic devices running at 1 GHz. That represents about a 1 million-fold speedup versus Lightelligence's 100-device prototype, Comet, unveiled in 2019. The latest demonstration also marks the first time Lightelligence showed use cases beyond AI acceleration on its hardware.

Pace can run algorithms from the NP-Complete class of problems, which are computationally extremely difficult, many times faster than existing accelerators. While not demonstrating optical superiority for all applications, it did execute the Ising problem 100 times faster than a typical GPU, even beating a system purpose-built for the Ising problem—Toshiba's simulated bifurcation machine, which runs on FPGAs—by a factor of 25.

STMicroelectronics unveils PowerGaN product family

STMicroelectronics has unveiled its first devices in the new PowerGaN product family as part of its STPOWER portfolio. Designed to enable more energy-efficient and slimmer power supplies, the new PowerGaN power semiconductor's target applications include consumer equipment such as chargers, external power adapters for PCs, LED-lighting drivers, and power supplies for televisions and home appliances.

In higher-power applications, the PowerGaN devices also can be designed into telecom power supplies, industrial motor drives, solar inverters, and electric vehicles and chargers.

Gallium nitride (GaN) is a compound wide-bandgap semiconductor material that offers several benefits over silicon, including higher voltages without trade-offs in on-resistance, very low switching losses, and higher frequency operation, said STMicroelectronics, which translate into higher efficiency as well as smaller sizes by reducing the size of passive components in the power application.