Photonics

Weekly Intelligence Report

2026-08-30 | 27 articles | 9 countries

troy-technical.jp

This Week's Keyword

AI Optical Interconnects

Terabit era, advanced packaging, supply chain

27	9	$2.51B	$2B
articles	countries	by 2034	investment
Total Articles Analyzed	Source Countries/Regions	TFLN Modulator Market	Coherent US Expansion

All 27 Articles This Week — 5-Axis Evaluation Matrix

How to read columns — Tech Novelty: degree of breakthrough Market Proximity: closeness to commercialization Market Impact: industry-wide effect Data Reliability: quantitative data & peer review US/EU Relevance: direct impact on US/European companies & supply chains

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#01	Solinide Photonics €4M	New Product	4	4	4	3	4	Swedish Solinide Photonics secures €4M to commercialize silicon nitride photonic chips for AI data centers.
#02	TFLN Modulator Market	Market Report	2	4	4	3	4	TFLN modulator market to reach $2.51B by 2034, driven by AI and next-gen optical modules.
#03	TFLN Coupled-Cavity Mod	Research	4	1	3	4	4	Heterogeneously integrated TFLN coupled-cavity modulator on silicon enables tunable frequency beam splitting for quantum photonics.
#04	Optical Comms Advances	Trend Analysis	3	4	4	2	4	Optical comms rapidly advancing: 1.6T transceivers deployed, 3.2T in testing for AI data centers.
#05	Lumentum NVIDIA 1.6T	Corporate Strategy	3	4	4	4	4	Lumentum secures multi-billion NVIDIA deal for 1.6T optical modules, expanding Japan InP production for AI data centers.
#06	Coherent Record Revenue	Corporate Strategy	3	4	4	4	4	Coherent reports record Q4 2026 revenue from 800G/1.6T optical transceiver demand, expanding 6-inch InP production.
#07	Enablence ShunYun Vietnam	Corporate Strategy	3	4	4	2	4	Enablence & ShunYun achieve volume production in Vietnam for 800G/1.6T, CPO/LPO PLCs, bolstering non-China supply.
#08	Coherent $2B US Invest	Corporate Strategy	3	4	4	3	4	Coherent partners with NVIDIA, invests $2B in US for optical component supply, R&D;, and manufacturing for AI.
#09	Ciena Q3 Earnings Focus	Corporate Strategy	2	4	3	2	4	Ciena's Q3 earnings focus on coherent optical solutions and network automation for carriers and cloud providers.
#10	High-Freq MLCC for Optics	Technology Analysis	3	4	3	2	3	High-frequency MLCC evolution is critical for 800G/1.6T optical modules, ensuring signal integrity in AI-era comms.
#11	Ciena UAE Network Deal	Corporate Strategy	3	4	3	2	4	Ciena secures e& UAE network deal, deploying WaveLogic coherent optical technology for high-capacity regional networks.
#12	SJTU FOWLP Opto-Elec	Research	4	2	4	3	4	Shanghai Jiao Tong University develops FOWLP for opto-electronic integration, halving signal loss in data centers.

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#13	TSMC 1.6nm A16 Process	New Technology	●●●●○	●●●○○	●●●●○	●●●○○	●●●●○	TSMC completes 1.6nm A16 process development, targeting Q4 mass production for next-gen AI/HPC chips.
#14	Rapidus 8-Reticle Inter	Technology Roadmap	●●●●○	●●○○○	●●●●○	●●●○○	●●●●○	Rapidus targets 8-reticle interposers on 600mm advanced packaging panels by 2030 for AI/HPC.
#15	Alibaba RISC-V AI Chip	New Product	●●●●○	●●●○○	●●●●○	●●●○○	●●●●○	Alibaba develops RISC-V chip capable of running 27 billion parameter AI model without a GPU.
#16	Arteris AI Chip IP Prem	Market Analysis	●○○○○	●●●●○	●●●○○	●●○○○	●●●●○	Arteris reports high premium for AI chip IP, reflecting soaring demand for specialized silicon.
#17	TIER IV Renesas SDV	Corporate Strategy	●●●○○	●●●○○	●●●●○	●●○○○	●●●○○	TIER IV and Renesas partner to develop an AI-native Software-Defined Vehicle platform, integrating advanced sensing.
#18	Foundries Si Photonics	Trend Analysis	●●●○○	●●●●○	●●●●○	●●○○○	●●●●○	Semiconductor foundries evolve to drive industrialization of silicon photonics and advanced heterogeneous integration.
#19	Socionext Intel 18A-P	Corporate Strategy	●●●●○	●●●○○	●●●●○	●●●○○	●●●●○	Socionext adopts Intel 18A-P process, expanding SoC roadmap for next-gen opto-electronic device integration.
#20	imec Photonics SWIR	Research	●●●●○	●●○○○	●●●○○	●●●●○	●●●●○	imec presents CMOS-compatible SWIR sensing and scattering-compensated imaging breakthroughs for integrated photonics.
#21	Hesai China LiDAR Boom	Corporate Strategy	●●○○○	●●●●○	●●●●○	●●●○○	●●○○○	Hesai rides smart car boom in China, expanding LiDAR dominance and supply chain ambitions.
#22	Hamamatsu CMOS Sensors	Corporate Strategy	●●○○○	●●●●○	●●●○○	●●○○○	●●●●○	Hamamatsu Photonics Europe enhances imaging solutions with Fairchild Imaging CMOS sensor technologies post-acquisition.
#23	Optalysys Compute-in-Tran	Research	●●●●○	●○○○○	●●●●○	●●●○○	●●●●○	Optalysys demonstrates photonic hardware for 'compute-in-transit,' revolutionizing AI and cryptographic workloads.
#24	Innoviz China Supply	Market Analysis	●○○○○	●●●●○	●●●●○	●●○○○	●●●●○	Innoviz highlights growing risks for automotive OEMs due to excessive dependence on Chinese supply chains.
#25	GF 48V Power Delivery	Corporate Strategy	●●○○○	●●●●○	●●●○○	●●○○○	●●●●○	GlobalFoundries outlines strategic 48V power delivery approach to elevate data center energy efficiency.
#26	GUSS Ouster LiDAR	New Product	●●○○○	●●●●○	●●○○○	●●●●○	●●●●○	GUSS Automation selects Ouster Rev8 OS0 Digital LiDAR sensors for its next-gen autonomous orchard fleet.
#27	On-Chip BIC Lasers	Research	●●●●○	●○○○○	●●●●○	●●●○○	●●●●○	Compact on-chip BIC lasers deliver high-purity, linearly polarized light, accelerating optical computing and quantum photonics.

●●●●○ High ●●●○○ Med-High ●●○○○ Med ●○○○○ Low | Yellow highlight = featured article

Three Questions That Demand Your Decision This Week

❶ Is your AI infrastructure ready for the Terabit era?

The rapid deployment of 1.6T and testing of 3.2T optical transceivers, driven by AI workloads, demands immediate evaluation of current and planned data center interconnects. Are your platforms compatible with next-gen coherent optics, and can your procurement secure these critical components?

❷ How exposed is your supply chain to geopolitical risks?

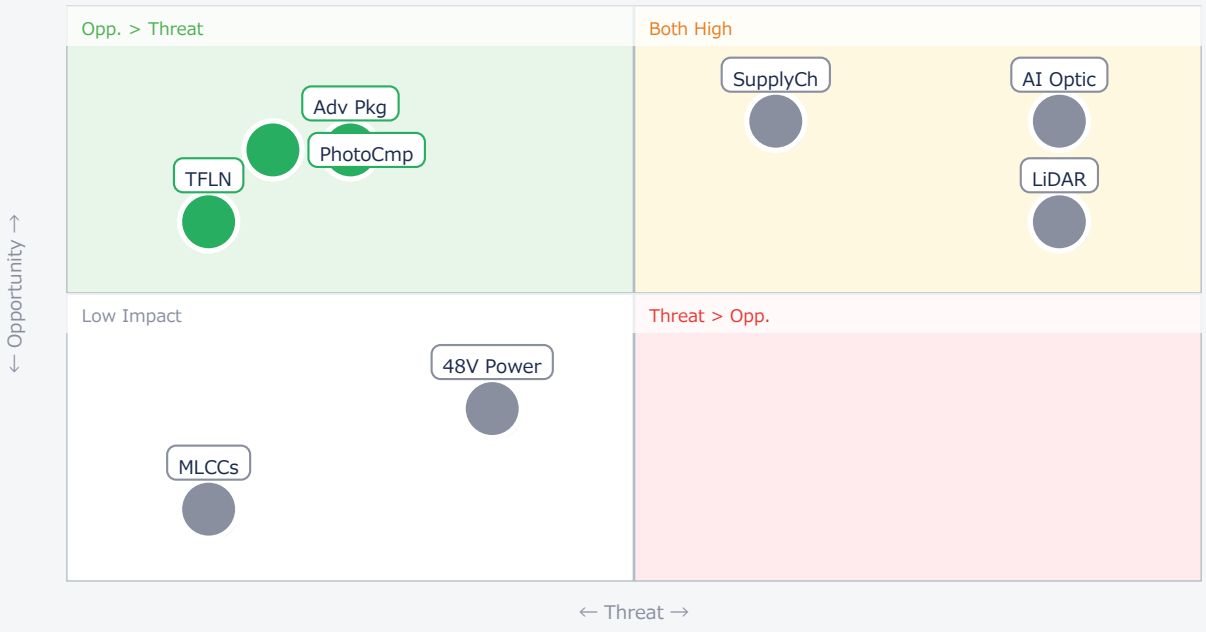
With increasing calls for non-China supply sources for critical components like optical PLCs and LiDAR, and significant US investments in domestic manufacturing, assess your reliance on single-region suppliers. What is your strategy for diversifying high-tech component sourcing?

❸ Are you investing in disruptive photonic computing?

Breakthroughs in compute-in-transit photonic hardware, on-chip BIC lasers, and quantum-ready TFLN modulators signal a long-term shift. Does your R&D; roadmap include these foundational technologies, or risk being outmaneuvered by competitors exploring optical AI accelerators?

Opportunities vs. Threats for US/European Companies

Opportunity vs. Threat Matrix for US/European Companies



Item	Quadrant	↑ Opportunity	↓ Threat
AI Optic	Critical	Bandwidth growth	Rapid obsolescence
SupplyCh	Critical	Resilient sourcing	China dependence
LiDAR	Critical	New markets	China dominance
TFLN	Opp.	High-speed mod	Niche tech
Adv Pkg	Opp.	Density, efficiency	Complex integration
PhotoCmp	Opp.	New architec	Long R&D; cycle
MLCCs	Ref.	Module stability	Component limits

● 48V Power	Ref.	Energy savings	Infra upgrade

Deep Dive ① — Optical Communications Enters Terabit Era

#04 | 2026/08/25 | Fibre Systems | Tech Novelty●●●○○ Proximity●●●●● Market Impact●●●●● Data Reliability●●○○○ US/EU Relevance●●●●●

The optical communications industry is accelerating into the terabit era, with 1.6T transceivers now deployed and 3.2T products entering testing. This rapid evolution, driven by AI workloads, necessitates physical layer advancements across optical components, fiber, and testing infrastructure. Coherent optics are extending into data center interconnects.

This pace means 800G, mainstream just two years ago, is quickly becoming legacy. The industry is now discussing 6.4T and beyond, fundamentally reshaping data center design and demanding continuous innovation from component manufacturers, fiber providers, and test equipment vendors.

▶ Strategic Analyst's Perspective

The reported acceleration is realistic given the insatiable demand from AI. Technical barriers include managing power consumption and heat at higher densities, and ensuring signal integrity across complex optical paths. [Opportunity] for US/EU component suppliers (e.g., coherent DSPs, lasers, modulators) to capture market share by leading 3.2T/6.4T development. [Threat] for OEMs relying on slower adoption cycles or legacy electrical interconnects, risking performance bottlenecks and competitive disadvantage. [R&D;] Initiate a 3.2T/6.4T readiness assessment this week. [Procurement] Evaluate current supplier roadmaps for next-gen components by next month.

Deep Dive ② — Lumentum Secures NVIDIA 1.6T Deal

#05 | 2026/08/28 | MarketBeat | Tech Novelty●●●○○ Proximity●●●●● Market Impact●●●●○ Data Reliability●●●●○ US/EU Relevance●●●●●

Lumentum is leading the 1.6T optical module market, securing a multi-billion dollar long-term agreement with NVIDIA for AI data center infrastructure. Shipments commenced in Q4 FY2026, demonstrating strong commercial traction for advanced optical interconnects.

To support this growth, Lumentum is expanding its Indium Phosphide (InP) wafer manufacturing capacity in Japan, preparing for 200G and future 300G lane speed technologies. This strategic investment highlights the critical role of InP in high-speed optical components and the need for scalable production.

▶ Strategic Analyst's Perspective

The NVIDIA deal validates Lumentum's market leadership and the urgent demand for 1.6T modules. The expansion of InP manufacturing in Japan is a realistic and necessary step to meet future demand, though scaling InP production efficiently remains a technical challenge. [Opportunity] for US/EU materials suppliers (InP substrates, epitaxy) and equipment vendors to support Lumentum's expansion. [Threat] for competitors unable to match Lumentum's scale or secure similar strategic partnerships, risking market share loss in the lucrative AI optical interconnect space. [Business Dev] Explore partnership opportunities with key AI infrastructure players by next quarter. [Procurement] Assess InP supply chain resilience and capacity by next month.

Deep Dive ③ — Photonic Compute-in-Transit Breakthrough

#23 | 2026/08/21 | Quantum Zeitgeist | Tech Novelty●●●●● Proximity●○○○○ Market Impact●●●●○ Data Reliability●●●○○ US/EU Relevance●●●●●

Optalysys has demonstrated innovative photonic hardware capable of performing computations directly as data travels from storage, a 'compute-in-transit' model. This aims to eliminate the critical data movement bottleneck in conventional computing, significantly enhancing AI and cryptographic workloads.

By leveraging light's speed and parallelism, this technology promises to dramatically reduce latency, bandwidth consumption, and energy use. It holds potential for revolutionizing demanding applications like AI model training/inference and fully homomorphic encryption, which are currently hampered by data movement.

▶ Strategic Analyst's Perspective

This is a significant academic breakthrough with immense long-term potential, though commercialization is 5+ years away. The primary technical barriers include achieving high computational precision, scalability, and integration with existing electronic systems. [Opportunity] for US/EU research institutions and deep-tech VCs to invest early in this paradigm shift, potentially leading to foundational IP. [Threat] for traditional CPU/GPU architects if this technology matures, as it could fundamentally alter computing architectures and render current approaches less efficient for specific workloads. [R&D;] Establish a dedicated team to monitor and evaluate optical computing advancements by next quarter. [Strategy] Begin scenario planning for compute-in-transit's impact on future data center designs within six months.

Other Notable Articles

Heterogeneously Integrated Thin-Film Lithium Niobate Coupled-Cavity Modulator (arXiv)
Tech Novelty●●●●● Proximity●○○○○ Market Impact●●●○○ US/EU Relevance●●●●○

Breakthrough in TFLN on silicon for tunable frequency beam splitting, crucial for future quantum photonics.

Shanghai Jiao Tong University Develops FOWLP for Seamless Opto-Electronic Integration, Halving Signal Loss in Data Centers (IMAPS 3D InCites Content Platform)
Tech Novelty●●●●○ Proximity●●○○○ Market Impact●●●●○ US/EU Relevance●●●●○

China's FOWLP innovation for opto-electronic integration could halve data center signal loss, impacting advanced packaging.

Semiconductor Foundries Evolve Role, Driving Industrialization of Silicon Photonics and Advanced Heterogeneous Integration (Design And Reuse)
Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●● US/EU Relevance●●●●●

Foundries are becoming critical for scalable silicon photonics and heterogeneous integration, a major industry shift.

Innoviz Highlights Growing Risks of Chinese Supply Chain Dependence for Automotive OEMs (Innoviz)
Tech Novelty●○○○○ Proximity●●●●● Market Impact●●●●● US/EU Relevance●●●●●

Urgent warning for automotive OEMs to diversify supply chains away from China, especially for high-tech components like LiDAR.

Solinide Photonics Secures €4M Seed Funding to Commercialize AI Data Center Photonic Chips (Tech.eu)
Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●○ US/EU Relevance●●●●●

Swedish startup securing funding to commercialize silicon nitride photonic chips for AI data centers, watch for market entry.

Recommended Actions This Week

Action recommendations based on article evaluation matrix and opportunity/threat analysis.

Immediate (this week)

- [Strategy] Conduct a rapid competitive analysis of 1.6T/3.2T optical module suppliers (Lumentum, Coherent) and their strategic partnerships (NVIDIA).
- [Procurement] Initiate an urgent review of critical optical component (transceivers, PLCs) supply chain resilience, identifying single points of failure, especially in China.

Short-term (1 month)

- [R&D;] Evaluate the technical feasibility and integration challenges of thin-film lithium niobate (TFLN) modulators for next-gen high-speed and quantum applications.
- [Business Dev] Engage with leading foundries (e.g., GlobalFoundries, Intel Foundry Services) to understand their advanced packaging and silicon photonics roadmaps.

Medium-long term (quarter+)

- [R&D;] Establish a dedicated research track for optical computing and quantum photonics, including compute-in-transit and on-chip laser technologies.
- [Strategy] Develop a long-term supply chain diversification strategy for all high-tech components, including potential investments in non-China manufacturing.
- [Executive] Assess the long-term impact of AI-native specialized hardware (e.g., RISC-V chips) on your product portfolio and market positioning.

Photonics — Selected Articles

Date: 2026-08-30

Articles: 27

Table of Contents

#17 TIER IV and Renesas Partner to Develop AI-Native Software-Defined Vehicle Platform, Integrating Advanced Sensing and Photonic Computing

#18 Semiconductor Foundries Evolve Role, Driving Industrialization of Silicon Photonics and Advanced Heterogeneous Integration

#19 Socionext Expands SoC Roadmap with Intel 18A-P Process, Bolstering Next-Gen Opto-Electronic Device Integration

#20 imec Presents Integrated Photonics Breakthroughs at SPIE Optics and Photonics 2026: CMOS-Compatible SWIR Sensing and Scattering-Compensated Imaging

#21 Hesai Rides Smart Car Boom in China, Expands LiDAR Dominance and Supply Chain Ambitions

#22 Hamamatsu Photonics Europe Enhances Advanced Imaging Solutions with Fairchild Imaging CMOS Sensor Technologies Post-Acquisition

#23 Optalysys Demonstrates Photonic Hardware for Compute-in-Transit, Revolutionizing AI and Cryptographic Workloads by Eliminating Data Movement Bottlenecks

#24 Innoviz Highlights Growing Risks of Chinese Supply Chain Dependence for Automotive OEMs

#25 GlobalFoundries Elevates Data Center Energy Efficiency with Strategic 48V Power Delivery Approach

#26 GUSS Automation Selects Ouster Rev8 OS0 Digital LiDAR Sensors for Next-Generation Autonomous Orchard Fleet

#27 Compact On-Chip BIC Lasers Deliver High Purity Linearly Polarized Light, Accelerating Optical Computing and Quantum Photonics

#01 Solinide Photonics Secures €4M Seed Funding to Commercialize AI Data Center Photonic Chips

Published Published August 20, 2026　Tech.eu　スウェーデン

OVERVIEW

Swedish deep-tech firm Solinide Photonics has closed a €4 million seed funding round to accelerate the commercialization of its silicon nitride (SiN) photonic integrated circuits and microcomb technology for AI data centers. This innovative solution replaces multiple laser sources with a single chip generating dozens of wavelengths, promising drastically increased data transmission capacity alongside significant reductions in power consumption, cost, and physical footprint. With demonstrated performance in data center links and successful integration into rack-mount systems, Solinide is now poised for real-world deployment.

IN DEPTH

The AI Data Bottleneck

The exponential growth of artificial intelligence (AI) and high-performance computing (HPC) has ignited an unprecedented surge in data movement within hyperscale data centers. This relentless demand is pushing traditional electrical interconnects to their absolute limits in terms of bandwidth, energy efficiency, and latency. Consequently, advanced optical communication solutions, particularly silicon photonics and microcomb technologies, are rapidly emerging as critical enablers for overcoming these architectural bottlenecks. There is an urgent need for scalable and energy-efficient optical interconnects to cope with ever-increasing AI model sizes and data traffic.

Solinide Photonics Secures Seed Funding

In a significant development, Swedish deep-tech company Solinide Photonics has successfully closed a €4 million seed funding round. This capital infusion is earmarked to accelerate the commercialization of its innovative silicon nitride (SiN) photonic integrated circuits (PICs) and microcomb technology, specifically targeting the demanding requirements of AI data centers. This investment validates Solinide's technological approach and underscores the growing industry demand for highly efficient optical communication solutions capable of meeting the escalating demands of next-generation AI workloads.

Technical Deep Dive: Microcomb Advantage

At the core of Solinide Photonics' offering is its proprietary microcomb technology, which fundamentally transforms optical interconnects. Unlike conventional systems that rely on multiple discrete laser sources, Solinide's solution utilizes a single, on-chip microcomb capable of generating dozens of distinct, precisely spaced wavelengths. This innovative approach promises to significantly enhance data transmission capacity over optical fibers, while simultaneously achieving substantial reductions in power consumption, operational costs, and physical footprint within AI data centers. The company has already demonstrated the required performance metrics for high-speed data center links and successfully integrated its solution into rack-mount systems. The choice of silicon nitride, renowned for its ultra-low optical loss and high-Q resonant cavities, positions their microcomb technology as a leading contender for next-generation optical engines, offering superior performance and cost-efficiency compared to conventional methods.

Strategic Impact and Future Outlook

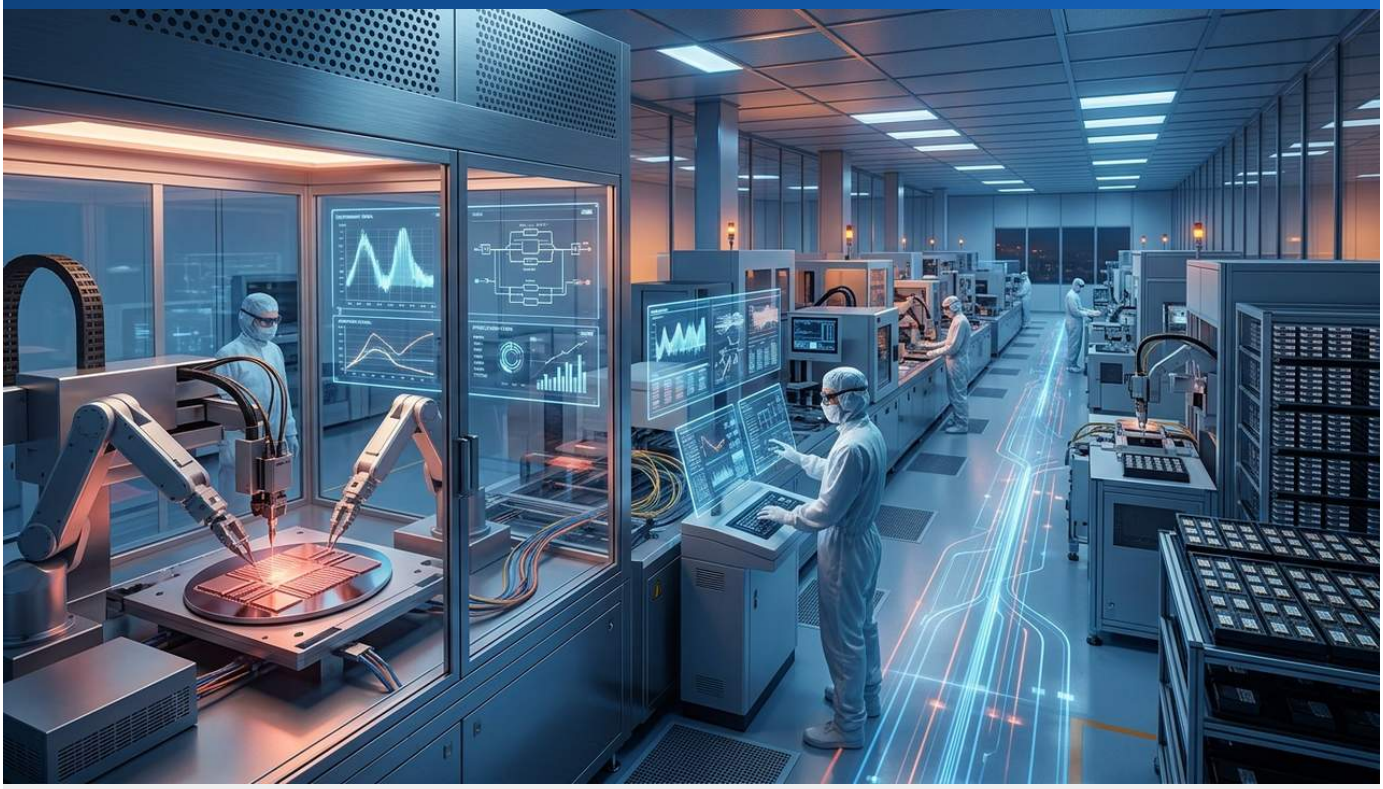
With this new capital, Solinide Photonics is poised to scale up its manufacturing capabilities and accelerate the deployment of its advanced photonic chips into commercial AI data centers. The widespread adoption of these high-efficiency optical solutions is expected to significantly drive down operational expenses and improve computational throughput for AI infrastructure providers. Solinide aims to establish itself as a key player in the global optical communication landscape, with ambitions extending beyond data centers to address other high-bandwidth, low-latency communication needs across various industries. By offering a viable and promising solution to the industry's most pressing challenges, the company seeks to secure a competitive edge in this rapidly expanding market.

Source: https://tech.eu/2026/08/20/solinide-closes-e4m-to-commercialise-photonic-chips-for-ai-data-centres/

Collected: August 28, 2026 | Automated Research System (Gemini API)

#02 Thin Film Lithium Niobate Modulator Market Projected to Reach $2.51 Billion by 2034

Published August 25, 2026 EINPresswire.com (The National Law Review) USA



OVERVIEW

The Thin Film Lithium Niobate (TFLN) modulator market is forecast to reach $2.51 billion by 2034, driven by escalating demand from AI infrastructure and next-generation pluggable optical modules. This growth is underpinned by TFLN's superior bandwidth, low drive voltage, low insertion loss, and manufacturing scalability. Heterogeneous integration of TFLN with silicon photonics platforms is enabling electro-optic performance exceeding 110GHz and wafer-scale production, critical for high-performance optical interconnects.

IN DEPTH

Report Overview

This market research report focuses on the global market for Thin Film Lithium Niobate (TFLN) modulators. The target market includes diverse applications demanding high-speed and high-efficiency optical communication, such as AI infrastructure and next-generation pluggable optical modules. Regional market trends across North America, Europe, Asia Pacific, and other regions are analyzed, covering the period from the present up to 2034.

Key Findings

The TFLN modulator market is projected to enter a commercially significant growth phase from 2026 onwards, driven by the expanding demand from AI infrastructure and high-performance data centers. According to the report, the market is expected to reach a size of $2.51 billion by 2034. This growth is attributed to the superior characteristics offered by TFLN technology, specifically its high bandwidth, low drive voltage, low insertion loss, and the scalability of its manufacturing processes.

Crucially, the heterogeneous integration of TFLN as a modulator within silicon photonics platforms holds immense potential. This integration enables electro-optic performance exceeding 110 GHz and high-volume, wafer-scale production, achieving a synergy of performance and cost efficiency previously challenging with conventional technologies. This advancement is expected to significantly enhance the performance of next-generation optical transceivers and interconnects, contributing to the alleviation of bottlenecks in data centers and communication networks.

About the Publisher

EINPresswire.com is a service that distributes press releases from companies and organizations to media outlets worldwide. This report was prepared by a market research firm and made public through EINPresswire.com.

Source: https://natlawreview.com/press-releases/thin-film-lithium-niobate-modulator-market-reach-usd-

2510-million-2034-48

#03 Heterogeneously Integrated Thin-Film Lithium Niobate Coupled-Cavity Modulator Enables Tunable Frequency Beam Splitting on Silicon

Published August 27, 2026 arXiv International

OVERVIEW

Researchers have developed a heterogeneously integrated thin-film lithium niobate (TFLN) coupled-cavity modulator on silicon that achieves tunable bidirectional frequency mode conversion. This breakthrough allows for advanced photon manipulation, including 50/50 frequency beam splitting and near-perfect frequency swapping, paving the way for scalable integrated frequency-bin quantum photonic circuits. The approach offers critical material flexibility for co-integration with other photonic elements, poised to advance quantum computing and communication.

IN DEPTH

Key Findings

A novel study has demonstrated a breakthrough in tunable bidirectional frequency mode conversion using a heterogeneously integrated thin-film lithium niobate (TFLN) coupled-cavity modulator on a silicon substrate. This technology enables precise photon manipulation, including 50/50 frequency beam splitting and near-perfect frequency swapping, which are crucial operations for frequency-bin qubits in quantum information science. This represents a significant step forward for the realization of scalable integrated quantum photonic circuits.

Technical Details

The coupled-cavity modulator leverages heterogeneous integration, directly combining TFLN with a silicon-on-insulator (SOI) platform. Lithium niobate is renowned for its excellent electro-optic properties, allowing for high-speed and efficient modulation of optical signals. However, its bulk form presents significant challenges for large-scale integration. By fabricating TFLN in a thin-film configuration and integrating it onto a silicon substrate, the researchers have overcome these integration hurdles, achieving both high integration density and superior performance.

Specifically, by tuning the cavity structure, the device can precisely convert frequency modes of incoming light. This capability is expected to enable applications such as efficient manipulation of frequency-encoded photons in quantum computing and information transfer between different frequency bands in quantum communication. The experiments successfully demonstrated high conversion efficiency and low crosstalk, also highlighting the potential for co-integration with other photonic components like integrated photon-pair sources, spectral filters, active tuning elements, and single-photon detectors.

Background & Context

Frequency-bin qubits are attracting considerable attention in quantum information science due to their robustness and high capacity. However, the development of scalable and efficient integrated photonic circuits for manipulating these qubits remains a major challenge, particularly concerning material incompatibility and the complexity of circuit scaling. This heterogeneous integration of TFLN with silicon photonics offers a promising solution by combining silicon's mature manufacturing processes with TFLN's superior electro-optic characteristics.

Strategic Significance & Outlook

This technology is poised to become a foundational element for building next-generation quantum computers and quantum networks. It is expected to accelerate the realization of complex quantum operations on a single chip, contributing to the development of more practical quantum devices. In the long term, this approach could open new avenues for larger-scale frequency-bin quantum photonic circuits, entanglement generation, and various quantum gate operations, pushing the boundaries of quantum information processing.

Source: https://arxiv.org/abs/2608.26028

#04 Optical Communications Rapidly Advances: 1.6T Transceivers Deployed, 3.2T in Testing as Terabit Era Dawns

Published August 25, 2026 Fibre Systems UK

OVERVIEW

The optical communications industry has rapidly progressed, with 1.6T transceivers now operational and 3.2T products entering testing just two years after 800G became mainstream. This rapid evolution is directly addressing the explosion in bandwidth demand driven by AI workloads, necessitating physical layer advancements across optical components, fiber, and testing infrastructure. Coherent optics, originally for long-haul, is now extending into data center interconnects and even shorter links as "coherent light."

IN DEPTH

Key Findings

The optical communications industry has demonstrated an astonishing pace of evolution over the past two years. Just two years after 800G optical transceivers became state-of-the-art, 1.6T transceivers are already in active deployment, and next-generation 3.2T technology is currently undergoing testing. Furthermore, discussions are actively underway regarding future transmission speeds of 6.4T and beyond. This trajectory signifies a rapid transition into the terabit era, primarily driven by the explosive increase in bandwidth demand from AI workloads within data centers.

Technical Details

The acceleration in speeds is a direct response to the exponential growth of data volumes in data centers and network infrastructures. AI applications, in particular, demand unprecedented bandwidth and low latency that conventional network designs can no longer accommodate. Consequently, the entire optical communication physical layer is undergoing a significant overhaul. This includes the development of higher-performance optical components, advanced fiber optic cables, and sophisticated testing infrastructure to accurately evaluate these new, higher speeds.

A notable technical advancement is the expanded application of coherent optical technology. Originally utilized in long-haul communication and submarine cable systems to maximize signal quality and transmission distance, coherent technology is now being introduced into data center interconnects and even shorter links, often referred to as "coherent light." This enables higher data density and more efficient signal processing even in short-distance environments within data centers, leading to an overall improvement in system performance.

Background & Context

High-computational AI and machine learning workloads generate massive amounts of data, not only between data centers but also within data center server-to-server communications. This makes the performance of optical communication devices as critical as processor and storage advancements in addressing network bottlenecks. The entire industry is now rushing to innovate and scale production capabilities across the supply chain to meet the demands of this "terabit takeover."

Strategic Significance & Outlook

Over the next few years, 1.6T, 3.2T, and 6.4T optical transceivers and beyond are expected to become the market mainstream. This will fundamentally reshape data center design philosophies, enabling more efficient connection of large-scale, distributed AI compute resources. Optical component manufacturers, fiber providers, and test equipment vendors are poised to capitalize on this wave of acceleration, continuing their technological innovations to play a crucial role in supporting future data infrastructure.

Source: https://www.fibre-systems.com/article/out-now-fibre-systems-autumn-2026-terabit-takeover-here

Collected: August 28, 2026 | Automated Research System (Gemini API)

#05 Lumentum Drives 1.6T Optical Module Market with NVIDIA Multi-Billion Deal, Expands Japan Production for AI Data Centers

Published August 28, 2026 MarketBeat USA

OVERVIEW

Lumentum is capitalizing on the rapid shift to optical connectivity in AI data centers, achieving market leadership with its 1.6T optical modules. The company commenced shipments in Q4 FY2026 and secured a multi-billion dollar long-term agreement with NVIDIA to meet AI infrastructure demand. To support this growth, Lumentum is expanding indium phosphide (InP) wafer manufacturing capacity in Japan for 200G and future 300G lane speed technologies. Its Cloud Light module business has also recovered to over $200 million in quarterly revenue, solidifying future growth.

IN DEPTH

Key Findings

Lumentum is capturing significant growth opportunities driven by the accelerated transition to optical connectivity within AI data centers. The company has taken a leading position in the next-generation 1.6T optical module market, commencing shipments in Q4 of its fiscal year 2026. Notably, Lumentum has secured a multi-billion dollar long-term agreement with NVIDIA to fulfill the escalating demands of AI infrastructure, solidifying its strong market position. To meet this robust demand, Lumentum is substantially expanding its production capacity at its Indium Phosphide (InP) wafer manufacturing facility in Japan, preparing for 200G and future 300G lane speed optical technologies.

Technical Details

The explosive growth in data volumes from AI workloads has exposed the physical limitations of copper connectivity within data centers, making the transition to optical interconnects inevitable. Lumentum is at the forefront of the acceleration trend from 800G to 1.6T systems, with its technologies spanning advanced solutions like optical circuit switches, Near-Packaged Optics (NPO), and Co-Packaged Optics (CPO). The company's 1.6T modules deliver industry-leading performance and reliability, accelerating their adoption, especially in bandwidth-intensive AI cluster systems.

Furthermore, Lumentum is leveraging its deep expertise in Indium Phosphide (InP) technology, particularly enhancing its wafer manufacturing capabilities at its Japanese facilities. This represents a strategic investment aimed at supporting higher-density optical transmission technologies, such as 200G per lane and the upcoming 300G per lane. The company's Cloud Light module business has also rebounded, achieving over $200 million in quarterly revenue, demonstrating the broad strength of its product portfolio.

Background & Context

The evolution of AI is revolutionizing High-Performance Computing (HPC) and data center designs, creating new bottlenecks that traditional network infrastructures cannot address. To resolve these, optical technologies are becoming indispensable for connecting processors and memory, within server racks, and between data centers. Lumentum is strategically positioned as a key technology provider during this transformative period. Despite intense competition from major players like Cisco and NVIDIA, Lumentum's technological superiority and strategic partnerships serve as key strengths.

Strategic Significance & Outlook

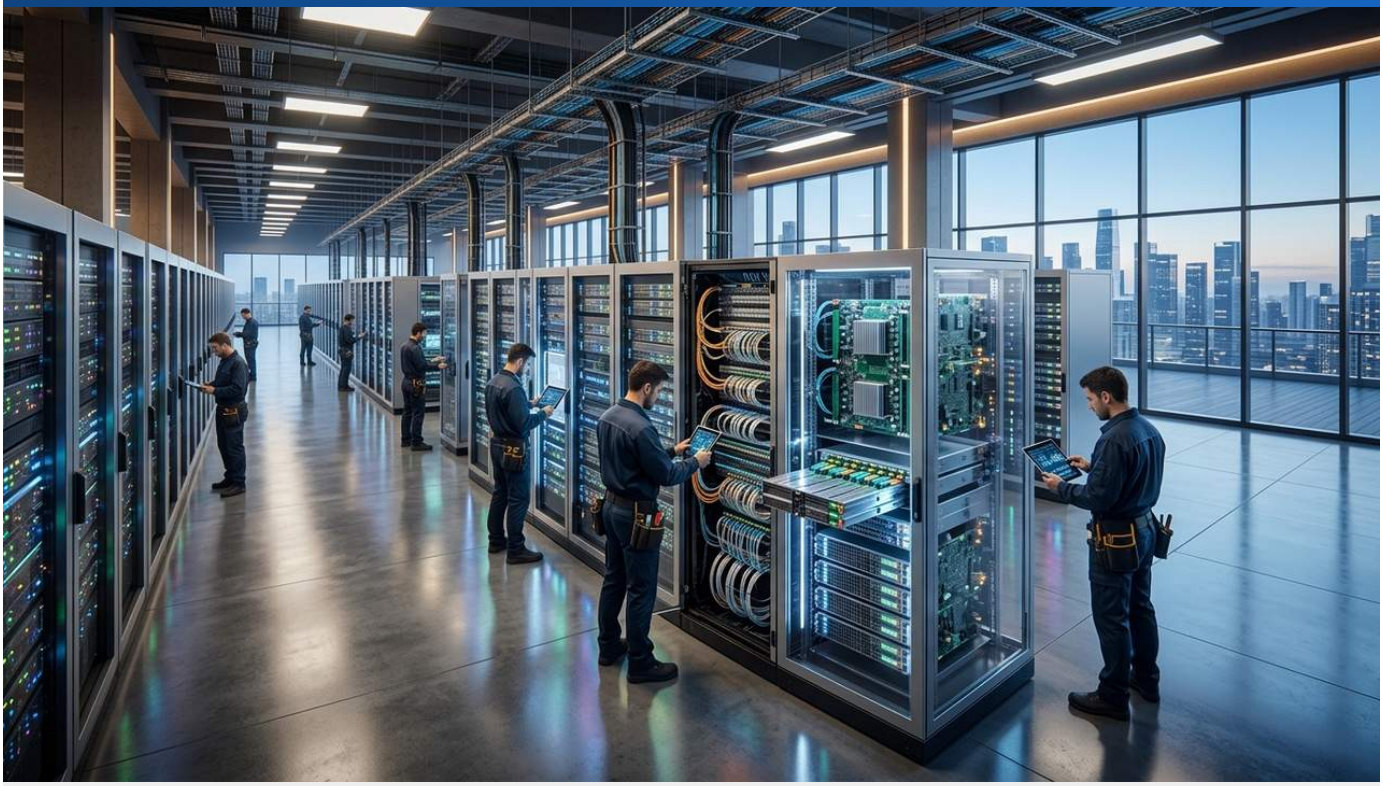
Lumentum anticipates continued growth in AI data center demand beyond 2028, projecting long-term market expansion. The company plans to reinforce its market leadership by maintaining its leading position in 1.6T modules while focusing on the development of future technologies for 3.2T and higher speeds. The collaboration with NVIDIA, in particular, will further elevate Lumentum's importance within the AI ecosystem. The capacity expansion at its Japanese manufacturing sites is expected to contribute to global supply chain stability and the rapid market introduction of new-generation technologies.

Source: https://www.marketbeat.com/instant-alerts/event-lumentum-sees-ai-data-centers-driving-major-optical-connectivity-growth-2026-08-27/

Collected: August 28, 2026 | Automated Research System (Gemini API)

#06 Coherent Achieves Record Q4 2026 Revenue, Driven by Robust 800G/1.6T Optical Transceiver Demand from AI Data Centers

Published August 20, 2026 The Motley Fool USA



OVERVIEW

Coherent reported record revenue for its fiscal Q4 2026, fueled by strong demand for 800G and 1.6T optical transceivers due to the shift from copper to optical connectivity in AI data centers. The company is significantly expanding its production capacity for these next-generation transceivers, particularly through a transition to 6-inch Indium Phosphide (InP) manufacturing. Demand remains high, with a strong outlook extending into 2028, highlighting optical communication's critical role in the AI era.

IN DEPTH

Key Findings

Coherent announced record-breaking revenue for its fiscal fourth quarter of 2026, largely driven by the rapid transition to optical connectivity within AI data centers. Strong demand for both 800G and 1.6T optical transceivers was a primary contributor to this revenue surge. To meet this robust demand, the company is strategically enhancing its production capacity, notably by transitioning to 6-inch Indium Phosphide (InP) manufacturing. Coherent maintains a strong business outlook extending into 2028, underscoring the indispensable role of optical communication technology in the AI era.

Technical Details

The proliferation of AI workloads is placing unprecedented demands on data transmission within data centers, pushing the limits of traditional copper interconnects in terms of performance and efficiency. Coherent's 800G and 1.6T optical transceivers are core technologies addressing these challenges. These transceivers deliver high bandwidth, low power consumption, and minimal latency, efficiently supporting the massive data movement required within AI clusters.

Specifically, the transition to 6-inch InP wafer manufacturing is a strategic move designed to significantly improve production efficiency and cost-effectiveness. InP is a crucial compound semiconductor for high-speed optical devices, and scaling up wafer size enables the fabrication of a greater number of devices per wafer. This allows Coherent to respond to soaring market demand more quickly and on a larger scale, thereby establishing a competitive advantage.

Background & Context

The data center market is undergoing an unprecedented transformation driven by the rise of generative AI and machine learning. Traditional network infrastructure is struggling to keep pace with the bandwidth and processing power demanded by AI applications. Consequently, data center operators and cloud service providers are accelerating the adoption of optical infrastructure, increasing their reliance on high-performance optical component suppliers like Coherent. The shift from copper to optical connectivity is not merely a technical choice but an economic and performance imperative for building next-generation AI infrastructure.

Strategic Significance & Outlook

Coherent's management anticipates that the growth in the AI data center market will be sustained, projecting stable demand well into 2028 and beyond. The company plans to maintain and strengthen its market leadership by continuously expanding production capacity and investing in research and development of advanced optical technologies. With preparations underway for next-generation technologies beyond 1.6T, Coherent's role as a critical partner in the AI ecosystem is expected to expand even further in the coming years.

Source: https://www.fool.com/earnings/call-transcripts/2026/08/19/coherent-cohr-q4-2026-earnings-call-transcript/

#07 Enablence and ShunYun Achieve Volume Production Readiness in Vietnam for 800G/1.6T, CPO/LPO High-Speed PLCs, Bolstering Non-China Supply

Published August 27, 2026 Newsfile USA

OVERVIEW

Enablence Technologies and ShunYun Technology have achieved volume production readiness at their new Vietnam facility, set to support the growth of AI data centers. The factory will produce high-speed Planar Lightwave Circuit (PLC) products for 800G, 1.6T, Co-Packaged Optics (CPO), and Linear Pluggable Optics (LPO applications. This initiative provides hyper-scalers and telecom operators with a crucial non-China supply source, diversifying and strengthening the global supply chain for advanced optical components.

IN DEPTH

Key Findings

Enablence Technologies and ShunYun Technology have completed preparations for volume production of high-speed Planar Lightwave Circuit (PLC) products at their newly established factory in Vietnam, designed to cater to the rapid growth of AI data centers. This strategic move enables both companies to produce components for next-generation high-speed optical communication standards like 800G and 1.6T, as well as products for Co-Packaged Optics (CPO) and Linear Pluggable Optics (LPO). The Vietnam facility will significantly contribute to diversifying and strengthening the global supply chain by offering hyper-scalers and telecom operators a vital alternative sourcing option outside of China.

Technical Details

The explosive proliferation of AI clusters is imposing unprecedented demands for bandwidth and efficiency on optical communication infrastructure within data centers. Planar Lightwave Circuits (PLCs) are foundational technologies for routing, splitting, and combining optical signals compactly and with high precision, forming a core component of optical transceivers and interconnects. The PLC products supplied by Enablence and ShunYun Technology support ultra-high transmission speeds of 800G and 1.6T, essential for CPO and LPO, which are next-generation technologies.

CPO involves directly integrating optical modules into the processor chip package, effectively eliminating electrical bottlenecks and dramatically reducing power consumption and latency. LPO, conversely, optimizes cost and power efficiency by omitting the Digital Signal Processor (DSP) chip. The Vietnam factory will contribute to improving AI infrastructure performance and reducing costs by large-scale production of PLCs compatible with these advanced optical technologies.

Background & Context

In recent years, the resilience of global supply chains has gained paramount importance, accelerating efforts to reduce reliance on specific countries or regions for the manufacturing of semiconductors and critical electronic components. The establishment of volume production in Vietnam by Enablence and ShunYun Technology is positioned as a key part of this "China Plus One" strategy. This allows hyper-scalers and telecommunication operators to diversify geopolitical risks and secure a more stable supply of components. As AI data center construction progresses globally, securing reliable supply chains becomes a critical competitive factor for businesses.

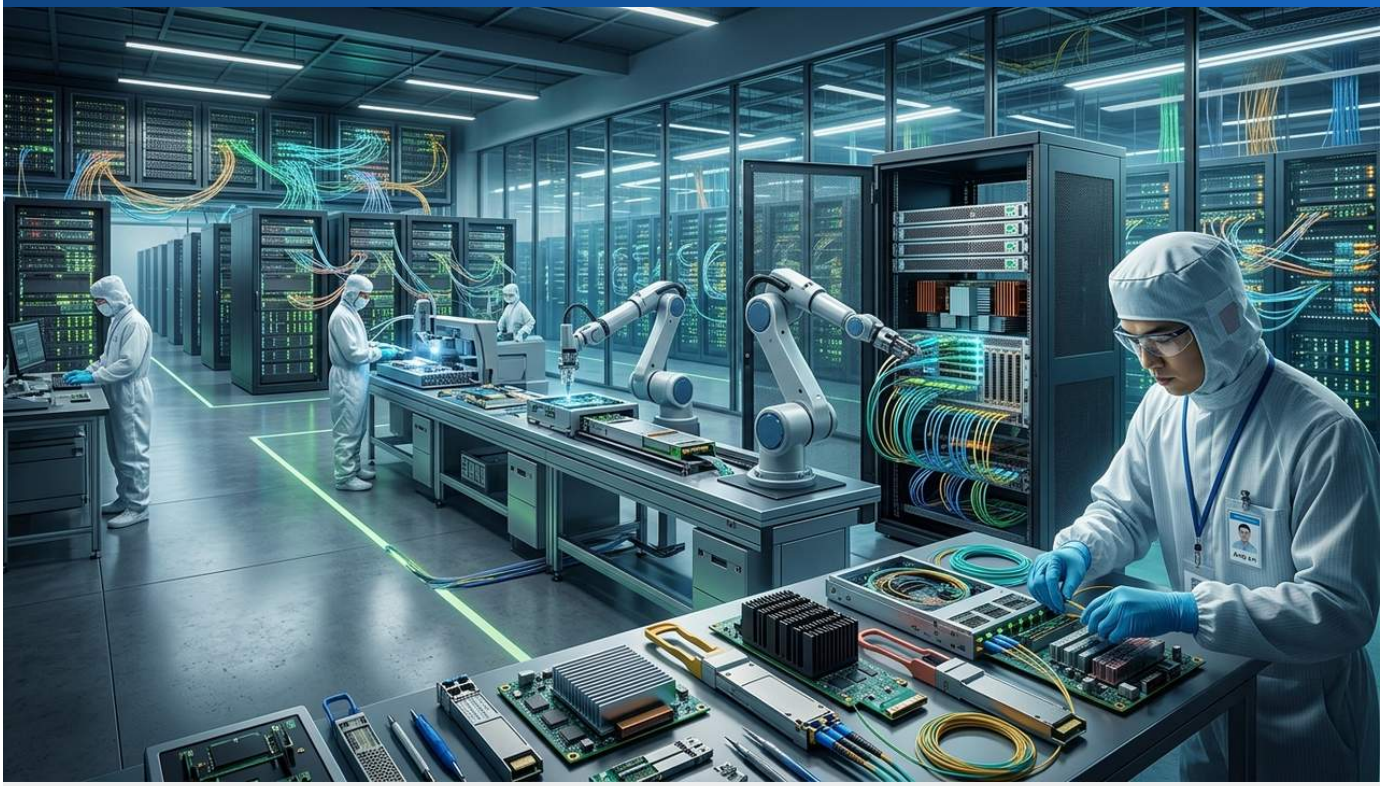
Strategic Significance & Outlook

The commencement of volume production at the new Vietnam factory marks a significant milestone for Enablence and ShunYun Technology in strengthening their position in the global AI infrastructure market. Both companies are likely to leverage this new facility to further accelerate the growth of the high-speed optical communication market. Establishing a manufacturing base outside of China provides customers with more options and contributes to the healthy development of the overall market. In the future, the introduction of even more advanced photonics technologies and further expansion of production capacity are likely also under consideration.

Source: https://www.newsfilecorp.com/release/311744/Enablence-Technologies-and-ShunYun-Technology-Complete-Volume-Production-Readiness-at-Vietnam-Fab-Designed-to-Support-AI-Data-Centers-Growth

#08 Coherent Accelerates AI Optical Interconnect Growth with NVIDIA Partnership and $2 Billion US Investment Plan, Meeting 800G/1.6T Demand

Published August 23, 2026 Andy Lin's Long-term Stock Investment Blog USA



OVERVIEW

Coherent is addressing increasing demand for advanced 800G/1.6T optical transceivers and photonic components driven by expanding AI data center infrastructure and high-performance computing. The company strengthened its strategic partnership with NVIDIA and announced a $2 billion investment plan to expand optical component supply, R&D, and manufacturing capacity in the US. This investment accelerates the development and mass production of next-generation optical technologies crucial for high bandwidth and low latency AI workloads, solidifying Coherent's market leadership.

IN DEPTH

Key Findings

Coherent is actively responding to the escalating demand for advanced optical transceivers and photonic components, fueled by the rapid expansion of AI data center infrastructure and high-performance computing (HPC). The company is focusing particularly on 800G and 1.6T and beyond high-speed optical transmission technologies. To bolster its leadership in this sector, Coherent has deepened its strategic partnership with NVIDIA. Furthermore, it announced a $2 billion investment plan aimed at significantly expanding its optical component supply, research and development capabilities, and manufacturing capacity within the United States, cementing its pivotal role in the AI era.

Technical Details

Modern AI models demand the processing of immense data volumes during training and inference, making communication bandwidth and latency within data centers critical factors. Coherent's 800G, 1.6T, and higher-speed optical transceivers are key to resolving these bottlenecks. These transceivers can transmit data at much higher speeds and with greater efficiency compared to electrical signals, while also reducing power consumption. Optical path switching technology is also essential for enhancing network flexibility and efficiency.

The $2 billion investment will not only accelerate R&D for cutting-edge photonic components but also be allocated to modernizing and expanding manufacturing facilities in the United States. This will enable Coherent to strengthen supply chain resilience, mitigate geopolitical risks, and ensure stable supply to its customers. The partnership with a major player in the AI ecosystem like NVIDIA specifically means Coherent's technology can be deeply integrated into AI accelerators and HPC systems, providing more optimized solutions.

Background & Context

The evolution of AI is revolutionizing data center architectures, triggering a massive shift from traditional copper-based interconnects to optical solutions. In this transformative period, Coherent is playing a central role, leveraging its extensive expertise in engineering materials, optoelectronic components, and laser technology. Collaborations with industry leaders such as NVIDIA validate Coherent's technologies at the forefront of the AI industry, further enhancing its market competitiveness.

Strategic Significance & Outlook

Coherent's $2 billion investment plan and its partnership with NVIDIA indicate the company's commitment to a long-term growth strategy in the AI optical interconnect market. Strengthening manufacturing capabilities in the US will enhance customer trust and provide a critical option in the global supply chain. As AI workloads become even more complex and data transfer speed requirements increase in the coming years, Coherent's advanced optical technologies are predicted to be indispensable in meeting this sustained demand.

Source: https://www.granitefirm.com/blog/us/2026/08/23/coherent-optic-laser/

Collected: August 28, 2026 | Automated Research System (Gemini API)

#09 Ciena Awaits Q3 2026 Earnings, Market Focus on Coherent Optical Solutions and Network Automation Trajectory

Published August 27, 2026 MarketBeat USA

OVERVIEW

Ciena is set to announce its Q3 FY226 earnings, drawing market attention to its performance and strategic direction. Its product portfolio, tailored for carriers, cloud providers, and large enterprises, encompasses coherent optical solutions for bandwidth optimization and latency reduction, advanced packet networking platforms, and a network automation software suite. These solutions are vital for building the high-speed, efficient network infrastructure demanded by the modern digital economy, making the upcoming earnings a key indicator of Ciena's market strategy health.

IN DEPTH

Key Findings

Ciena, a leading company in communication and networking technology, is nearing its Q3 fiscal year 2026 earnings announcement, drawing market attention to its performance and future strategies. This earnings report will serve as a crucial indicator of Ciena's capability to meet the escalating network demands driven by the rapid proliferation of AI and cloud services. Particular focus will be on the demand trends for its coherent optical solutions and network automation software.

Technical Details

Ciena's extensive product portfolio provides essential technologies for today's data-intensive environments. At its core are coherent optical solutions designed to optimize bandwidth and significantly reduce network latency. These solutions deliver high performance across a wide range of applications, from long-haul transmission to metropolitan area networks and data center interconnects (DCI).

Furthermore, the company offers advanced packet networking platforms, enabling carriers and cloud providers to efficiently route and manage diverse traffic. Ciena's network automation software suite contributes to reducing operational complexity, accelerating provisioning, and increasing service delivery flexibility, thereby cutting operating costs and enhancing efficiency. These technologies play a crucial role in meeting the bandwidth and low-latency requirements driven by the explosive growth of AI applications.

Background & Context

In today's digital economy, the advancements in 5G, IoT, cloud computing, and AI are placing unprecedented loads on network infrastructure. In this scenario, companies like Ciena are increasing their presence by offering innovative solutions to challenges that traditional network architectures cannot address. Telecommunication operators and enterprise customers are seeking comprehensive solutions, such as Ciena's integrated portfolio, to manage increasing data volumes while improving operational efficiency.

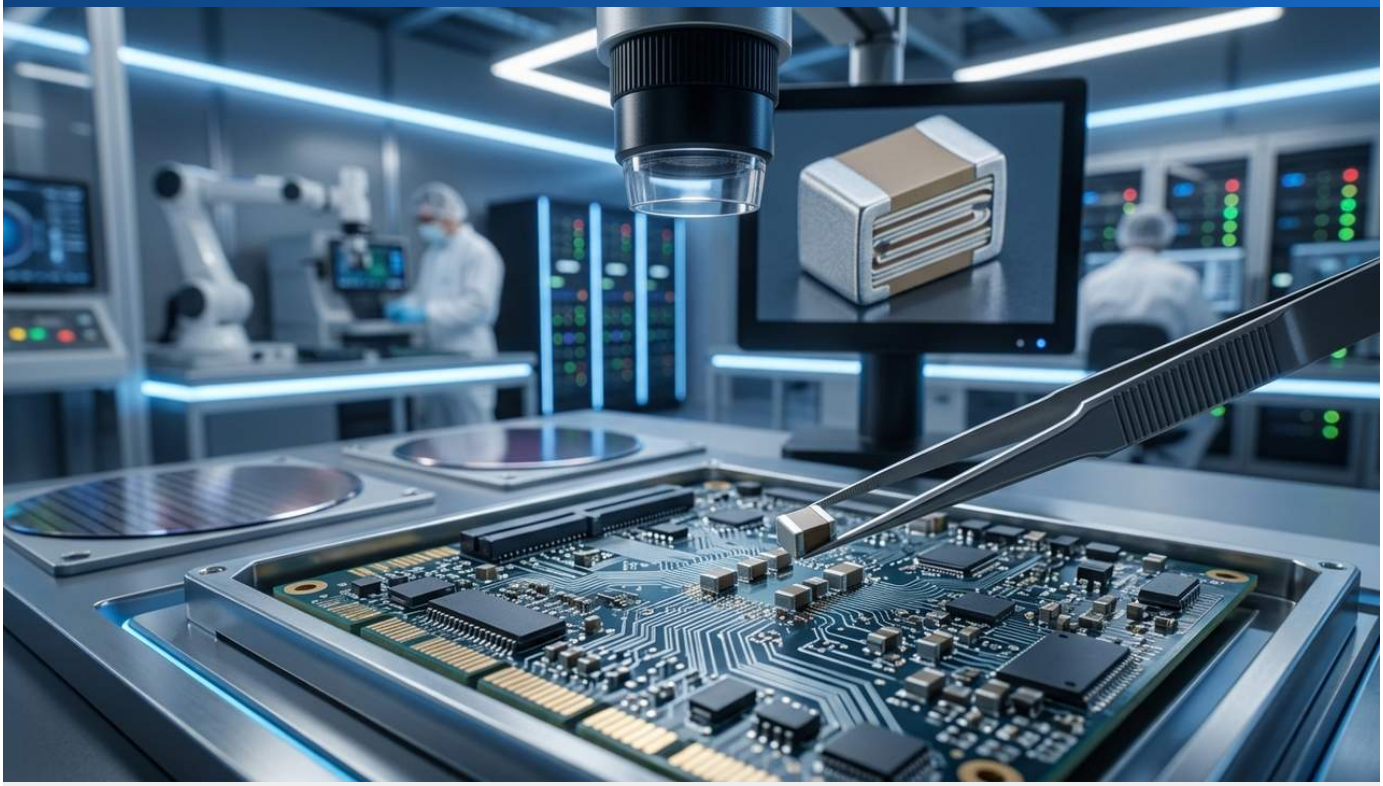
Strategic Significance & Outlook

Ciena's future performance hinges on the continuous evolution of its coherent optical technology and the market penetration of its network automation solutions. The company leads the market with its coherent optical technologies, such as the WaveLogic series, and is likely to further accelerate its deployment in AI data centers and cloud edge networks. The upcoming earnings announcement will provide vital clues as to how Ciena plans to capture these growth opportunities and maintain its competitive edge in the market. Investors and industry stakeholders are keenly awaiting future guidance and announcements regarding technological innovations.

Source: https://www.marketbeat.com/instant-alerts/upcoming-ciena-cien-expected-to-announce-earnings-on-thursday-2026-08-27/

#10 High-Frequency MLCC Evolution Critical for 800G/1.6T Optical Modules: Enabling AI-Era High-Capacity Communications

Published August 21, 2026 Barron (Barron MLCC) International



OVERVIEW

The evolution of high-frequency multilayer ceramic capacitors (MLCCs) is proving critical for enabling next-generation 800G and 1.6T optical modules. These ultra-high-speed modules require ultra-small, high-performance MLCCs to minimize power supply ripple and ensure signal integrity, supporting multi-channel lasers and complex DSPs within compressed spaces. Proper MLCC selection and placement are paramount for overall module performance, representing a crucial, behind-the-scenes technological advancement supporting high-capacity communication in the AI era.

IN DEPTH

Key Findings

It has become clear that technological innovation in high-frequency multilayer ceramic capacitors (MLCCs) is essential for maximizing the performance of next-generation optical modules, such as 800G and 1.6T. These optical modules must efficiently and stably operate multi-channel lasers and complex digital signal processing (DSP) chips within confined, compressed spaces. Consequently, ultra-small, high-performance, and high-reliability MLCCs are critical components for ensuring signal integrity and minimizing power supply ripple.

Technical Details

800G and 1.6T optical modules integrate a high density of electronic components to transmit vast amounts of data at high speeds. Particularly, multi-channel laser drivers, Transimpedance Amplifiers (TIAs), and high-speed DSPs require stable power supply and noise suppression. MLCCs are positioned in close proximity to these components, functioning as decoupling capacitors to filter out high-frequency noise and provide stable voltage in response to rapid current changes.

The challenges lie in the severe space constraints within the module and the high-frequency environment, extending into tens of gigahertz. Traditional MLCCs may struggle with self-resonant frequency and inductance characteristics, failing to deliver the desired noise suppression performance. Therefore, modern optical modules demand ultra-small MLCCs with lower Equivalent Series Inductance (ESL) and Equivalent Series Resistance (ESR), exhibiting stable characteristics across a broad frequency range. The strategic placement of multiple MLCCs to minimize power supply impedance is key to ensuring overall system signal integrity.

Background & Context

With the advancement of AI data centers and high-performance computing, the speed and density of optical communications are increasing exponentially. This in turn drives up power consumption and heat generation in optical modules, constantly demanding miniaturization and higher efficiency. MLCCs, as the "unsung heroes" of electronic circuits, play a vital, albeit often unnoticed, role in the stable operation of the entire system. Optical module vendors rely heavily on the performance improvement of passive components like MLCCs, in parallel with high-performance optoelectronic devices. Technological innovation from the supplier side is thus foundational to the evolution of optical communication.

Strategic Significance & Outlook

Future optical modules are expected to evolve towards 3.2T and even higher speeds. Correspondingly, MLCCs will be required to achieve further miniaturization, higher capacitance, and improved high-frequency characteristics. Ensuring reliability against temperature variations and aging will also be critical challenges. MLCC manufacturers are expected to meet these demands through the development of new dielectric materials and improvements in lamination technology. The continuous mutual evolution of optical modules and MLCC technology will lay the groundwork for future high-capacity, high-speed communication infrastructure.

Source: https://www.barronmlcc.com/light-speed-flow-behind-the-scenes-high-frequency-mlcc-survival-rules-in-800g/1.6t-optical-modules.html

Collected: August 28, 2026 | Automated Research System (Gemini API)

#11 Ciena Gains Focus with e& UAE Network Deal, Deploying WaveLogic Coherent Optical Technology for High-Capacity Regional Networks

Published August 20, 2026 Kalkine Media USA

OVERVIEW

Ciena is drawing significant attention with its e& UAE (formerly Etisalat UAE) network deployment, providing integrated solutions including advanced optical hardware, coherent technology, and network control software for high-capacity regional networks. Ciena's portfolio focuses on optical networking, featuring WaveLogic coherent technology and various transmission platforms for data center interconnect, cloud connectivity, and long-haul networks. This deal exemplifies Ciena's contribution to strengthening digital infrastructure in the Middle East and highlights the success of its global strategy.

IN DEPTH

Key Findings

Ciena has garnered significant industry attention with its major network deployment project for e& UAE (formerly Etisalat UAE), a leading telecommunications provider in the Middle East. Under this agreement, Ciena supplied e& UAE with an integrated solution combining cutting-edge optical hardware, innovative coherent technology, and advanced network control software to build high-capacity regional networks. This underscores Ciena's pivotal role in the evolution of global telecommunications infrastructure.

Technical Details

Ciena's WaveLogic coherent technology plays a central role in e& UAE's network enhancement project. WaveLogic utilizes advanced Digital Signal Processing (DSP) to maximize the transmission capacity and reach of optical signals, significantly improving the utilization efficiency of existing fiber optic infrastructure. This results in increased bandwidth, reduced power consumption, and enhanced network flexibility.

Ciena's solutions extend beyond coherent optical transmission systems to include packet optical transport platforms and network management/automation software suites. This comprehensive offering enables e& UAE to provide diverse services, such as Data Center Interconnect (DCI), cloud connectivity, and long-haul networks, with higher efficiency and reliability. The solution is expected to support the construction of a scalable and programmable network, crucial for addressing the explosive growth of data traffic driven by AI and 5G adoption.

Background & Context

The Middle East region is actively pursuing digital transformation, marked by significant investments in high-speed and reliable communication infrastructure. Major telecommunication operators like e& UAE are adopting cutting-edge network technologies to meet customer demands. Ciena has maintained leadership in optical networking for many years, and its proven track record and technological prowess were key factors in securing this large-scale contract. Such infrastructure investments are essential for bridging regional digital divides and fostering new economic growth.

Strategic Significance & Outlook

This partnership with e& UAE not only strengthens Ciena's presence in the Middle East market but also enhances its credibility in the global market. Ciena will continue to focus on the evolution of WaveLogic technology and the deployment of network automation solutions to support the digital transformation of telecommunication and cloud service providers worldwide. As the demand for high-capacity networks continues to grow, Ciena's technology is predicted to become increasingly important as an indispensable component supporting the future digital society.

Source: https://kalkinemedia.com/us/stocks/technology/why-is-ciena-nysecien-in-focus-after-e-uae-network-deal

Collected: August 28, 2026 | Automated Research System (Gemini API)

#12 Shanghai Jiao Tong University Develops FOWLP for Seamless Opto-Electronic Integration, Halving Signal Loss in Data Centers

Published August 20, 2026 IMAPS 3D InCites Content Platform China

OVERVIEW

Researchers at Shanghai Jiao Tong University have pioneered a fan-out wafer-level packaging (FOWLP) technique to integrate electronic and photonic components, significantly reducing signal loss and improving interconnect density in data centers. The approach leverages redistribution layers (RDL) for high-precision connections and benzocyclobutene as a low-dielectric insulating material, enhancing thermal stability and reducing transmission loss for high-frequency operations. This breakthrough is critical for overcoming current data transfer bottlenecks, promising substantial performance and efficiency gains for next-generation AI and HPC infrastructure.

IN DEPTH

Key Findings

Researchers from Shanghai Jiao Tong University have made a significant leap in addressing the critical integration challenges of electronic and photonic components for high-speed data transfer in data centers. Their novel fan-out wafer-level packaging (FOWLP) technique achieves seamless integration, dramatically reducing signal loss and improving interconnect density in opto-electronic systems, paving the way for more powerful and energy-efficient computing.

Technical / Clinical Details

- **FOWLP for Hybrid Integration:** The core innovation lies in the use of FOWLP to directly integrate dissimilar electronic and photonic chips. This method allows for a much tighter and more efficient connection compared to traditional packaging.
- **High-Precision Redistribution Layers (RDL):** Essential for the FOWLP process, RDLs enable high-precision electrical and optical routing between the chips, facilitating complex interconnections with minimal signal degradation.
- **Benzocyclobutene (BCB) Dielectric:** The selection of benzocyclobutene as a low-dielectric insulating material is crucial. BCB not only reduces high-frequency transmission loss but also significantly improves the thermal stability of the integrated package, which is vital for sustained high-performance operation in dense data center environments.
- **Addressing Bottlenecks:** This advanced packaging solution directly tackles the bandwidth and power consumption bottlenecks inherent in traditional electrical interconnects, which become increasingly pronounced with the growing demands of AI and high-performance computing workloads.

Background & Context

The rapid expansion of AI and high-performance computing applications has placed immense pressure on data center infrastructure, particularly regarding the speed and efficiency of internal data transfer. While CPU and GPU computational power continues to advance, the electrical interconnects that link these processing units often become the limiting factor, hindering overall system performance. Silicon photonics and co-packaged optics (CPO) are recognized as key technologies to overcome these limitations by using light for data transmission. This research provides a crucial manufacturing pathway for the practical implementation of such integrated photonics, accelerating the transition from electrical to optical interconnects within compute units.

Strategic Significance & Outlook

This FOWLP technology represents a fundamental advancement for future data center architectures, AI supercomputers, and other high-performance computing clusters. By enabling ultra-dense and energy-efficient opto-electronic integration, it promises to significantly reduce the power consumption of data transfer while boosting overall computational throughput. The ability to seamlessly combine light and electronics on a single package will not unlock new levels of performance for AI training and inference, but also potentially accelerate the development of advanced applications in quantum computing and edge AI devices, broadening its impact across various industries globally.

Source: https://www.3dincites.com/2026/08/breaking-the-compute-barrier-with-light-silicon-photonics-co-packaged-optics-and-advanced-packaging/

Collected: August 28, 2026 | Automated Research System (Gemini API)

#13 TSMC Completes 1.6nm A16 Process Development, Targets Q4 Mass Production for Next-Gen AI/HPC Chips

Published August 24, 2026 Design And Reuse Taiwan

OVERVIEW

TSMC has successfully completed development of its 1.6nm A16 process technology, with mass production scheduled for Q4. This cutting-edge process is foundational for next-generation high-performance computing and AI applications, offering significant power efficiency and performance enhancements. Its deployment will indirectly bolster the silicon photonics ecosystem by improving the underlying electronic chip performance crucial for integrated opto-electronic solutions.

IN DEPTH

Key Findings

TSMC, the world's leading semiconductor foundry, has announced the completion of its 1.6nm A16 process technology development, with mass production slated for the fourth quarter of 2026. This significant milestone underscores TSMC's commitment to pushing the boundaries of semiconductor miniaturization and will serve as a critical enabler for the next wave of AI and high-performance computing (HPC) applications.

Technical / Clinical Details

- **A16 Process Advancements:** The A16 process represents a substantial leap in transistor density and power efficiency over previous nodes, though specific performance metrics have not yet been fully disclosed. This advancement is expected to deliver significant boosts in raw computing power while simultaneously reducing energy consumption.
- **Beyond Nanosheet Architecture:** The technology likely incorporates innovative transistor structures and material science to overcome the challenges of extreme miniaturization. This enables the fabrication of highly optimized chips for demanding workloads such as AI accelerators, data center processors, and advanced mobile computing platforms.
- **Timely Mass Production:** The Q4 2026 mass production timeline positions TSMC to reinforce its industry leadership and provide customers with the foundational technology needed to launch their next-generation products into competitive markets.

Background & Context

The semiconductor industry is locked in an intense race to develop smaller, more powerful, and more energy-efficient chips, driven largely by the insatiable demands of artificial intelligence. As Moore's Law faces increasing physical limits, advancements in process technology are paramount for maintaining the pace of innovation. While directly focused on electronic chips, TSMC's A16 process indirectly plays a vital role in the broader photonics ecosystem, particularly in silicon photonics and co-packaged optics (CPO). High-performance electronic control and signal processing circuits are essential for maximizing the efficiency, speed, and overall functionality of integrated optical communication solutions, which are becoming critical for alleviating data movement bottlenecks in advanced computing systems.

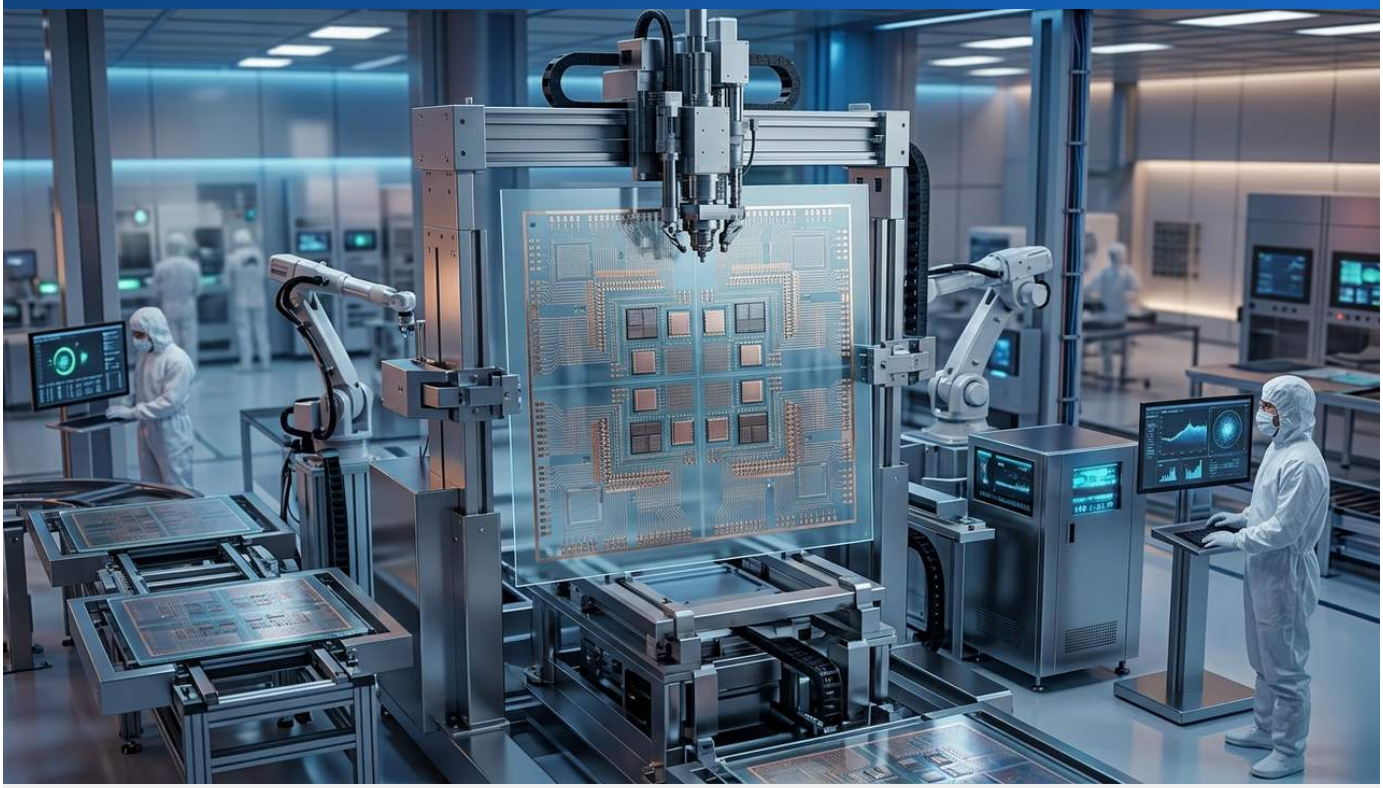
Strategic Significance & Outlook

The introduction of the A16 process will accelerate product development across key sectors including AI, HPC, autonomous driving, and 5G/6G communication. For silicon photonics, the enhanced performance and power efficiency of the electronic components fabricated on the A16 node will allow for more sophisticated and integrated opto-electronic devices. This will hasten the adoption of optical interconnect solutions, which are crucial for addressing the increasing data transfer demands and power consumption challenges within data centers and supercomputers. TSMC's continued technological leadership through nodes like A16 ensures a robust foundation for the future of both electronic and integrated photonic computing.

Source: #

#14 Rapidus Targets 8-Reticle Interposers on 600mm Advanced Packaging Panels by 2030, Accelerating Heterogeneous Integration for AI/HPC

Published August 24, 2026 Design And Reuse Japan



OVERVIEW

Japanese foundry Rapidus has unveiled an ambitious roadmap to achieve 8-reticle interposers on 600mm advanced packaging panels by 2030. This development is crucial for integrating complex chiplets, including photonic integrated circuits, to achieve significantly higher performance and density in future computing systems. It is expected to be a cornerstone for next-generation AI chips and data center infrastructure, enabling more efficient heterogeneous integration.

IN DEPTH

Key Findings

Rapidus, Japan's leading-edge semiconductor foundry, has outlined an aggressive development roadmap targeting the production of 8-reticle interposers on 600mm advanced packaging panels by 2030. This ambitious goal represents a critical step forward in high-density chiplet integration, promising a substantial boost in performance and density for future high-performance computing (HPC) and artificial intelligence (AI) systems.

Technical / Clinical Details

- **8-Reticle Interposer Scale:** While current interposer technologies typically involve smaller panel sizes and fewer reticles, Rapidus's target of 8 reticles on a 600mm panel significantly scales up the integration capability. This expansive platform will allow for the efficient connection of numerous complex chiplets, including CPUs, GPUs, memory, and critically, future photonic integrated circuits (PICs).
- **600mm Panel Utilization:** The adoption of 600mm panels for advanced packaging is driven by the need for enhanced cost efficiency and throughput. Larger panels enable the production of more interposers and final packaged units per manufacturing run, leading to economies of scale and improved productivity, which are vital for meeting the escalating demands of the semiconductor industry.
- **Advancing Heterogeneous Integration:** This technology is a cornerstone for heterogeneous integration, allowing different functional chiplets to be combined into a single package. For AI and HPC, where bandwidth and power efficiency are paramount, advanced packaging that can seamlessly merge electronic and optical components is indispensable.

Background & Context

The rapid proliferation of AI and the increasing demands of HPC have pushed conventional monolithic semiconductor manufacturing approaches to their limits. Chiplet technology, coupled with advanced packaging, has emerged as a strategic pathway to balance performance, power efficiency, and cost by combining individually optimized chip components. Rapidus's initiative is part of Japan's national strategy to regain competitive edge in leading-edge semiconductor manufacturing, with a particular focus on supplying the U.S. HPC market. This technology is expected to directly address the data processing bottlenecks in the AI era.

Strategic Significance & Outlook

Achieving Rapidus's 2030 goal will provide the foundational technology for next-generation AI accelerators, data center processors, supercomputers, and other high-density, high-performance computing systems. As optical technologies like silicon photonics advance, interposers will increasingly serve as crucial hubs for opto-electronic conversion modules and optical interconnects. This advanced packaging technology is not merely about linking chips; it aims to dramatically expand data transfer bandwidth and enhance system energy efficiency, thereby transforming the entire computing architecture for the AI era. Rapidus's success in this area could cement Japan's role as a key player in the global semiconductor advanced packaging landscape.

Source: #

#15 Alibaba Develops RISC-V Chip Capable of Running 27 Billion Parameter AI Model Without GPU

Published August 24, 2026 Design And Reuse China

OVERVIEW

Alibaba has developed a RISC-V-based chip that can execute a 27 billion parameter AI model without relying on a GPU. This achievement signals significant progress in specialized alternative chip architectures for AI workloads, offering a potential paradigm shift from GPU-centric approaches. Such dedicated hardware advancements could either complement or influence the trajectory of photonic AI accelerators, fostering more efficient AI computing.

IN DEPTH

Key Findings

Alibaba has announced the development of a groundbreaking RISC-V-based chip capable of running a 27 billion parameter AI model without the need for a traditional Graphics Processing Unit (GPU). This innovation marks a substantial advancement in specialized hardware for AI workloads, promising enhanced efficiency and potentially lower operational costs for large-scale AI deployment.

Technical / Clinical Details

- **RISC-V Architecture Leveraging:** The chip is built upon the open-source RISC-V instruction set architecture, which provides inherent flexibility for custom hardware acceleration tailored to specific AI computational patterns. This open standard allows for greater customization compared to proprietary architectures.
- **GPU-Independent AI Model Execution:** Historically, large AI models have been heavily dependent on GPUs due to their parallel processing capabilities. Alibaba's chip demonstrates the ability to handle a massive 27 billion parameter model autonomously, indicating a highly optimized design for AI inference that reduces reliance on general-purpose accelerators.
- **Specialized AI Workload Design:** It is inferred that the chip integrates dedicated hardware components optimized for common AI operations such as matrix multiplication and convolution, enabling it to perform these tasks with greater efficiency and lower power consumption than more generalized computing platforms.

Background & Context

The escalating scale of AI models has led to an exponential increase in computational resource and energy demands. While GPUs have been instrumental in fueling the AI revolution, their general-purpose nature can sometimes lead to inefficiencies for highly specific AI tasks. Consequently, there is a global push towards developing more specialized AI hardware, often leveraging open instruction sets like RISC-V, to improve power efficiency in data centers and enable AI at the edge. Alibaba's achievement also aligns with China's strategic initiatives to foster indigenous technological capabilities in the critical AI semiconductor sector.

Strategic Significance & Outlook

Alibaba's RISC-V chip introduces a compelling alternative in the AI accelerator market, with the potential to transform the cost and efficiency landscape of AI infrastructure, particularly for cloud-based AI services and data centers. Furthermore, the evolution of such dedicated AI hardware has indirect implications for the development of silicon photonics and optical computing. As optical interconnects become essential for addressing data movement bottlenecks in next-generation AI systems, the synergy between specialized electronic AI chips and optical accelerators could lead to even faster and more energy-efficient AI computing solutions. This development by Alibaba is expected to spur further diversification and optimization in AI hardware, driving broader innovation across the industry.

Source: #

#16 Arteris Reports High Premium for AI Chip IP, Reflecting Soaring Demand for Specialized Silicon

Published August 24, 2026 Design And Reuse USA

OVERVIEW

Arteris has observed a significant premium for AI chip intellectual property (IP) in the market, underscoring the escalating value of specialized IP in AI hardware development. Semiconductor manufacturers are actively adopting advanced IP to differentiate and optimize high-performance AI accelerator designs. This trend reflects a booming AI chip design ecosystem, including components potentially integrating with photonic technologies.

IN DEPTH

Key Findings

Arteris, a prominent provider of system-on-chip (SoC) interconnect IP, has highlighted a substantial premium commanded by intellectual property (IP) specifically designed for AI chips. This indicates a rapid appreciation for specialized IP as AI hardware development becomes increasingly complex and differentiated, driving demand for optimized, high-performance computing solutions.

Technical / Clinical Details

- **The Indispensable Role of IP:** In AI chip development, critical IP blocks—such as processing cores, memory interfaces, and Networks-on-Chip (NoCs)—are vital for accelerating development cycles, mitigating risks, and achieving aggressive performance targets. High-quality, AI-optimized IP directly impacts a product's competitive edge and time-to-market.
- **Factors Driving High Premiums:** AI workloads demand unique computational patterns and data flows that differ from conventional general-purpose computing. IP tailored to these specific characteristics is highly sought after. Developing such specialized IP in-house is both time-consuming and expensive, making licensing from established IP vendors a valuable strategic choice for chip designers.
- **Arteris's NoC Expertise:** As a leading NoC IP provider, Arteris plays a critical role in maximizing data transfer efficiency within AI chips. Given the immense data movement between cores and memory in AI accelerators, an efficient NoC is indispensable for alleviating system-level bottlenecks.

Background & Context

The AI chip market is experiencing exponential growth, spanning data centers, edge devices, autonomous vehicles, and more. This expansion compels companies to focus on developing increasingly sophisticated and specialized AI hardware to differentiate their products and enhance performance. IP licensing serves as a crucial strategic tool for development firms to streamline complex chip designs efficiently. As new technologies like silicon photonics gain traction for integration into AI accelerators, the demand for novel types of IP, such as those for opto-electronic conversion blocks and optical interconnects, is also expected to rise.

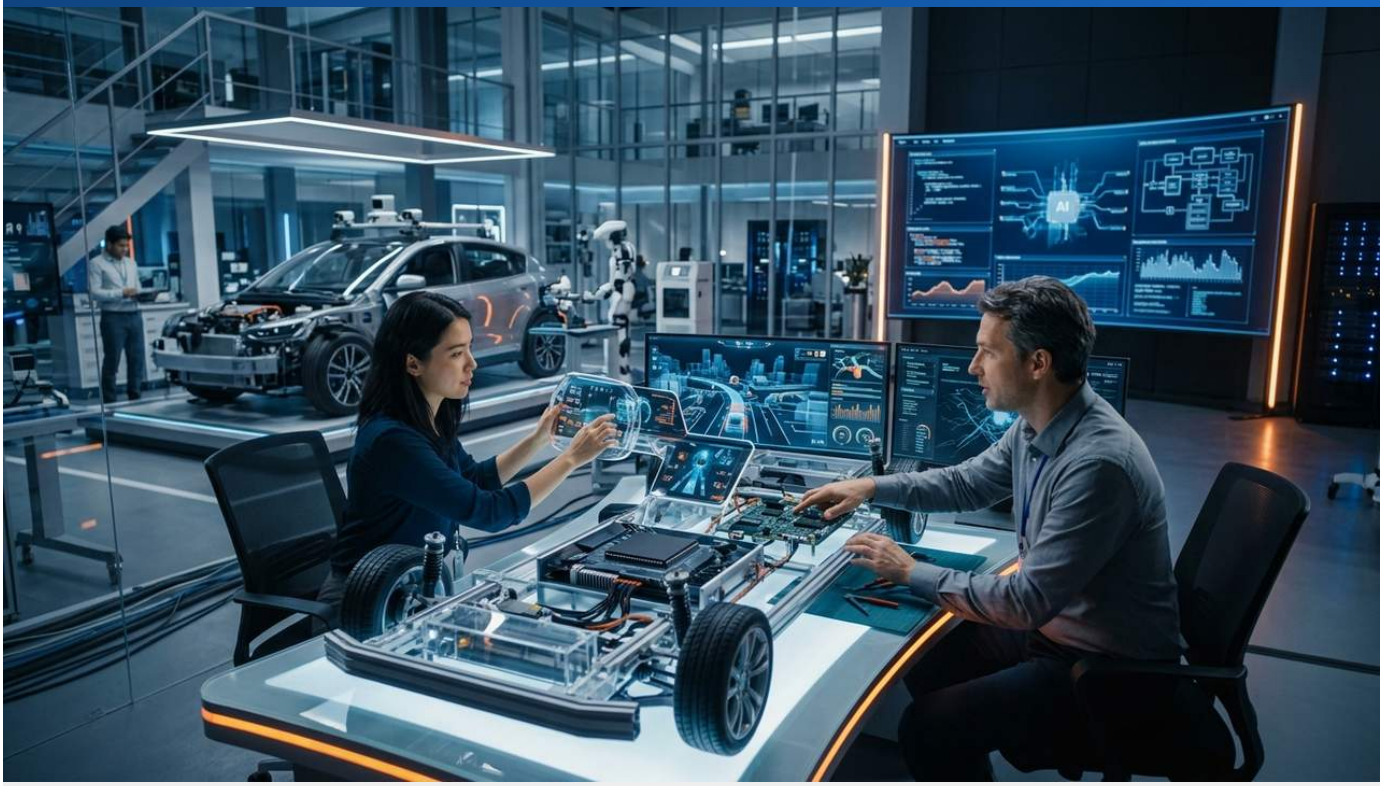
Strategic Significance & Outlook

The high premium for AI chip IP is anticipated to persist as AI technology advances and diversifies into more applications. This trend not only presents significant opportunities for IP vendors but also fosters healthy competition and innovation across the entire semiconductor ecosystem. In the future, IP related to emerging computing paradigms like optical computing and quantum computing is likely to emerge. IP providers such as Arteris are poised to play an even more critical role as bridges enabling the integration of these new technologies with existing electronic systems. This synergistic development promises to push AI hardware performance and efficiency to unprecedented levels.

Source: #

#17 TIER IV and Renesas Partner to Develop AI-Native Software-Defined Vehicle Platform, Integrating Advanced Sensing and Photonic Computing

Published August 24, 2026 Design And Reuse Japan



OVERVIEW

Japanese autonomous driving firm TIER IV and semiconductor giant Renesas Electronics have announced a partnership to co-develop an AI-native Software-Defined Vehicle (SDV) platform. This collaboration aims to accelerate AI integration into automotive systems, driving the utilization of advanced sensing technologies like LiDAR and potentially photonic computing in future autonomous vehicles. The combined expertise is expected to significantly enhance the safety and functionality of autonomous driving.

IN DEPTH

Key Findings

TIER IV, a leader in autonomous driving software development based in Japan, and Renesas Electronics, a global automotive semiconductor powerhouse, have formed a strategic alliance to co-develop an AI-native Software-Defined Vehicle (SDV) platform. This collaboration is set to accelerate the integration of AI and autonomous driving technologies into the automotive sector, laying the groundwork for next-generation vehicles.

Technical / Clinical Details

- **AI-Native SDV Platform:** The platform will define a significant portion of vehicle functionalities through software, with AI at its core. This design aims to enable continuous functional updates and the deployment of advanced autonomous driving capabilities, allowing vehicles to evolve throughout their lifecycle.
- **Leveraging TIER IV's Autoware:** TIER IV is renowned for developing and providing Autoware, an open-source autonomous driving software. Their expertise and proven track record will be central to the platform's development, with Autoware's flexibility and scalability supporting diverse use cases.
- **Renesas's Automotive Semiconductor Solutions:** Renesas brings a comprehensive suite of automotive semiconductor solutions, including high-performance Systems-on-Chip (SoCs), microcontrollers (MCUs), and power management ICs, which will form the hardware backbone for efficient and safe AI processing within the platform.
- **Role of LiDAR and Photonics:** Advanced autonomous driving critically relies on precise sensing technologies, such as LiDAR, for environmental perception. The platform is designed to process vast amounts of sensor data in real-time using AI, with future potential for photonic computing to enhance data processing capabilities and power efficiency.

Background & Context

The automotive industry is undergoing a profound transformation driven by 'CASE' (Connected, Autonomous, Shared, Electric) trends, where software and AI are increasingly determining vehicle value. SDVs conceptualize vehicles not merely as hardware assemblies but as 'computers on wheels' whose functions are defined and evolve through software updates. The partnership between TIER IV and Renesas is a significant strategic move for Japan to lead in the SDV domain, particularly aiming for the realization of safe and highly reliable autonomous driving systems.

Strategic Significance & Outlook

This AI-native SDV platform is expected to dramatically enhance the computational power, responsiveness, safety, and development flexibility for next-generation vehicles targeting Level 3 and above autonomous driving. The collaboration between TIER IV and Renesas is not just about developing autonomous cars but potentially revolutionizing automotive design, manufacturing, and user experience. The continuous advancement of optical sensing technologies like LiDAR, along with optical communication for mitigating data transfer bottlenecks and photonic computing for accelerating AI processing, will be key to further boosting this platform's performance and accelerating the realization of future mobility.

Source: #

#18 Semiconductor Foundries Evolve Role, Driving Industrialization of Silicon Photonics and Advanced Heterogeneous Integration

Published August 20, 2026 Design And Reuse USA

OVERVIEW

Semiconductor foundries are shifting their role from pure transistor manufacturing to providing advanced packaging and heterogeneous integration solutions. This evolution is crucial for the burgeoning chiplet ecosystem, responding to the escalating demands of AI and high-performance computing. For integrated photonic circuits, the precision and scalability offered by foundries are becoming foundational for the industrialization and widespread adoption of silicon photonics technology.

IN DEPTH

Key Findings

Industry analysis indicates a significant evolution in the role of semiconductor foundries, transitioning from merely fabricating semiconductor chips to offering complex advanced packaging solutions and enabling heterogeneous integration of diverse chiplets. This transformation is driven and accelerated by the explosive growth in artificial intelligence (AI), high-performance computing (HPC), and data center demands.

Technical / Clinical Details

- **Beyond Traditional Foundry Models:** Historically, foundries focused primarily on the miniaturization and integration of transistors. However, modern needs have shifted towards 'system-level integration,' optimizing the combination of various functional blocks within a chip.
- **Rise of Advanced Packaging:** Technologies such as fan-out packaging, 2.5D/3D stacking, and CoWoS (Chip-on-Wafer-on-Substrate) are becoming central to foundry service offerings. These techniques enable the close interconnection of chiplets manufactured at different process nodes, maximizing performance and power efficiency.
- **Contribution to Heterogeneous Integration:** Foundries are now supporting the integration of not only electronic chips but also memory, RF components, and critically, optical devices like silicon photonics. This capability allows for the seamless combination of electrical and optical components within a single package, enabling opto-electronic integrated devices that address data transfer bottlenecks.
- **Impact on Silicon Photonics Manufacturing:** The fabrication of integrated photonic circuits demands high precision and reproducibility, similar to electronic chip manufacturing. The mature CMOS manufacturing processes offered by foundries are essential for achieving high-volume production and cost-efficient manufacturing of silicon photonics.

Background & Context

As the physical limits of Moore's Law approach, the semiconductor industry is seeking new avenues for performance enhancement and cost reduction. Heterogeneous integration through chiplets and advanced packaging is one such path, allowing for the combination of individually optimized functional blocks. This trend directly addresses the increasing bandwidth requirements of data centers and the computational demands of AI/HPC. By embracing this expanded role, foundries empower design companies to bring more complex and higher-performing chips to market more rapidly.

Strategic Significance & Outlook

The evolving role of foundries will significantly accelerate the industrialization of silicon photonics technology. Applications requiring optical technology, such as optical communication modules, optical computing, and advanced sensing, heavily rely on the high-reliability and scalable manufacturing capabilities that foundries provide. This transformation will strengthen the entire ecosystem, from the design to the mass production of opto-electronic integrated chips, fostering innovation in areas like next-generation optical interconnects for data centers, AI accelerators, and even quantum computing. Foundries are elevating their presence from mere manufacturers to strategic partners collaboratively driving technological innovation.

Source: #

#19 Socionext Expands SoC Roadmap with Intel 18A-P Process, Bolstering Next-Gen Opto-Electronic Device Integration

Published August 20, 2026 Design And Reuse Japan

OVERVIEW

Socionext has broadened its System-on-Chip (SoC) roadmap by adopting Intel's advanced 18A-P process technology. This strategic move strengthens the foundation for supporting complex integration required for next-generation opto-electronic devices. Specifically, it enables the development of highly functional devices incorporating silicon photonics, contributing to high-speed and efficient data processing in data centers and AI infrastructure.

IN DEPTH

Key Findings

Socionext, a leading SoC design and development company, has announced the expansion of its System-on-Chip (SoC) roadmap through the adoption of Intel's cutting-edge 18A-P process technology. This collaboration is set to enable the realization of next-generation high-performance and complex SoC designs, with a strong focus on advancing opto-electronic devices that integrate silicon photonics.

Technical / Clinical Details

- **Adoption of Intel 18A-P Process:** The 18A-P is one of Intel's most advanced process technologies, featuring innovative elements such as the Gate-All-Around (GAA) transistor structure 'RibbonFET' (succeeding FinFET) and the 'PowerVia' backside power delivery network. These technologies promise high transistor density and superior power efficiency.
- **Expansion of SoC Roadmap:** By leveraging the 18A-P process, Socionext plans to design and develop SoCs for more demanding applications, including AI accelerators, data center processors, and high-performance networking chips, thereby extending its market reach and technological capabilities.
- **Enabling Opto-Electronic Device Integration:** The high integration density and power efficiency offered by the 18A-P process are critical for realizing next-generation opto-electronic devices, such as co-packaged optics (CPO), where silicon photonics are directly integrated into SoCs. This tight coupling of electrical and optical signal processing will resolve data transfer bottlenecks and boost overall system performance.

Background & Context

The proliferation of AI and High-Performance Computing (HPC) demands unprecedented levels of performance and efficiency from semiconductor chips. Traditional electrical interconnects are increasingly becoming a data transfer bottleneck, making the integration of optical technologies an imperative. For SoC design companies like Socionext to adopt state-of-the-art foundry processes from Intel is a common strategy to share development costs and risks while rapidly bringing advanced technologies to market. This collaboration underscores the acceleration of technological innovation in the semiconductor industry and the potential for new SoCs through heterogeneous integration.

Strategic Significance & Outlook

Socionext's adoption of the Intel 18A-P process significantly increases the likelihood of innovative opto-electronic devices emerging across diverse sectors, including data centers, 5G/6G communication, autonomous vehicles, and edge AI devices. Specifically, the ability to directly integrate silicon photonics into high-performance SoCs will dramatically improve the power efficiency and bandwidth of AI accelerators and high-speed networking equipment. This advancement will contribute to reducing data center power consumption, accelerating AI inference and training speeds, and fostering the wider adoption of optical communication technologies, marking a crucial milestone in building next-generation digital infrastructure.

Source: #

#20 imec Presents Integrated Photonics Breakthroughs at SPIE Optics and Photonics 2026: CMOS-Compatible SWIR Sensing and Scattering-Compensated Imaging

Published Published August 23, 2026　imec　ベルギー

OVERVIEW

At SPIE Optics and Photonics 2026, imec presented two major integrated photonics advancements. Gökhan Kara unveiled a CMOS-compatible platform for cost-effective SWIR spectral sensing, while Filip Milojković introduced a photonic integrated circuit enabling real-time scattering compensation for clearer imaging and endoscopy. These innovations underscore imec's leadership, promising to significantly expand integrated photonics applications in diverse fields from medical diagnostics to industrial inspection.

IN DEPTH

imec, the world-leading research and innovation hub in nanoelectronics and digital technologies, has unveiled two groundbreaking integrated photonics advancements at SPIE Optics and Photonics 2026. These breakthroughs—a CMOS-compatible platform for Short-Wave Infrared (SWIR) spectral sensing and a photonic integrated circuit for real-time scattering compensation in imaging—are poised to revolutionize advanced sensing, medical diagnostics, and industrial inspection, significantly broadening the application scope of integrated photonics.

Background

The Short-Wave Infrared (SWIR) spectrum offers unique insights, such as distinct water absorption characteristics and chemical composition identification, often inaccessible to visible or long-wave infrared light. Despite its diagnostic and analytical potential, SWIR sensing has historically been hampered by expensive, bulky, and power-intensive sensor technologies. Similarly, in fields like medical imaging, light scattering poses a significant challenge, severely degrading image quality in endoscopic examinations and deep-tissue imaging. Integrated photonics technologies capable of addressing these long-standing limitations are in high demand across a diverse range of sectors, including medical diagnostics, industrial quality control, and security.

Key Findings

At SPIE Optics and Photonics 2026, imec presented two distinct yet synergistic integrated photonics innovations:

- **CMOS-Compatible SWIR Spectral Sensing Platform (Gökhan Kara, presented August 25):** Gökhan Kara introduced a pioneering photonic-optoelectronic platform that leverages compatibility with existing, high-volume CMOS manufacturing processes. This breakthrough promises to drastically reduce the cost and scale of spectroscopic sensing in the SWIR range. SWIR light is invaluable for revealing information invisible to the human eye, with critical applications spanning material analysis, food quality inspection, non-invasive medical diagnostics, and enhanced surveillance. By enabling low-cost, high-volume production, this CMOS-compatible approach is set to accelerate widespread industrial adoption of SWIR sensing technology, opening new markets in smart agriculture, environmental monitoring, and intelligent factories.

- **Photonic Integrated Circuit for Scattering Compensation in Imaging and Endoscopy (Filip Milojković, presented August 27):** Filip Milojković unveiled a novel photonic integrated circuit (PIC) specifically designed to counteract the severe image degradation caused by light scattering in highly turbid media, such as biological tissues. When light propagates through such media, the optical signal becomes significantly distorted, limiting the clarity and depth of imaging. This research proposes a real-time compensation mechanism for imaging and endoscopy, enabling the acquisition of clearer, more detailed images. This advancement holds profound implications for improving the accuracy of medical diagnostics, particularly for image-guided procedures, early disease detection, and precision surgery.
- **Integrated Photonics Foundation:** Both innovations are built upon imec's extensive, foundational expertise in integrated photonics, encompassing both silicon photonics and Indium Phosphide (InP) platforms. The ability to integrate multiple optical functional components onto a single chip is paramount to these advancements, allowing for unprecedented system miniaturization, higher energy efficiency, and substantial cost reduction. This integrated approach is key to moving these complex optical technologies from specialized labs into practical, widespread applications.

imec's continuous research leadership demonstrates that integrated photonics will be an indispensable technology for next-generation smart devices, advanced medical equipment, and sophisticated industrial systems. By lowering barriers to entry for advanced SWIR sensing and fundamentally improving imaging capabilities in scattering environments, these developments pave the way for broader consumer applications and critical advancements in fields ranging from autonomous systems to personalized medicine. These presentations at SPIE Optics and Photonics 2026 affirm imec's pivotal role in shaping the future of optical technology and its practical applications.

Source: https://www.imec-int.com/en/events/spie-optics-and-photonics

#21 Hesai Rides Smart Car Boom in China, Expands LiDAR Dominance and Supply Chain Ambitions

Published August 20, 2026 South China Morning Post China

OVERVIEW

Hesai, the world's largest LiDAR sensor manufacturer, is experiencing significant growth driven by the increasing adoption of smart cars in China. The company is supplying LiDAR sensors to major Chinese automotive groups, leveraging the steady rise in LiDAR-equipped new vehicles, and expanding its ambitions beyond the traditional supply chain. Hesai has established itself as a top technology firm, crucial for the evolution of autonomous driving.

IN DEPTH

Key Findings

Hesai Technology, the world's largest manufacturer of LiDAR sensors, is experiencing robust business growth, primarily fueled by the accelerating adoption of smart cars in the Chinese market. The company is not only bolstering its supply of LiDAR sensors to major Chinese automotive groups but is also strategically expanding its influence across the entire supply chain, solidifying its position as a leading advanced technology enterprise.

Technical / Clinical Details

- **LiDAR Market Leadership:** Hesai holds the largest global market share in automotive LiDAR, with widespread adoption by both emerging EV manufacturers and established automakers in China. Its sensors provide high-precision 3D environmental perception capabilities, forming the core of autonomous driving systems.
- **Increasing Smart Car Integration:** The proportion of new vehicles equipped with LiDAR in China is steadily rising, indicating a broad recognition of LiDAR's indispensable role in enabling advanced driver-assistance systems (ADAS) and full autonomous driving functionalities. Hesai's sensors offer high reliability even in complex traffic conditions and adverse weather.
- **Supply Chain Diversification and Vertical Integration:** Beyond being a mere sensor provider, Hesai is expanding its influence across the entire supply chain by developing key LiDAR components (such as laser light sources, detectors, and MEMS mirrors) in-house and through close collaborations with suppliers. This strategy enhances product cost competitiveness and supply stability.

Background & Context

China stands as the world's largest automotive market and a global leader in the adoption of electric vehicles (EVs) and smart cars. Autonomous driving technology is at the forefront of this smart car race, with LiDAR sensors playing a crucial role as the vehicle's 'eyes,' alongside cameras and radar. Amid rising geopolitical tensions, Chinese companies are accelerating the strengthening of domestic supply chains and technological self-reliance, with Hesai's growth emblematic of this trend. Its success highlights both the importance of LiDAR in the global automotive industry and the dynamism of the Chinese market.

Strategic Significance & Outlook

Hesai's LiDAR technology is set to further accelerate the proliferation of autonomous vehicles, becoming an indispensable component of future mobility. The company's initiatives in supply chain expansion will drive down LiDAR costs and improve performance, enabling broader integration across various vehicle segments. In the future, LiDAR technology is expected to find applications beyond autonomous driving, including in robotics, smart cities, and industrial automation. Hesai's continued growth and technological innovation are poised to drive the development of the overall LiDAR market, contributing significantly to a safer and more efficient society.

Source: https://www.scmp.com/business/china-evs/article/3364636/hesai-rides-lidar-growth-smart-cars-gain-ground-despite-chinas-struggling-market

#22 Hamamatsu Photonics Europe Enhances Advanced Imaging Solutions with Fairchild Imaging CMOS Sensor Technologies Post-Acquisition

Published August 20, 2026 Electronics360 Japan

OVERVIEW

Hamamatsu Photonics Europe is significantly strengthening its advanced imaging solutions by actively promoting Fairchild Imaging's advanced CMOS image sensor technologies, following its 2024 acquisition. This strategy has expanded Hamamatsu's portfolio to include high-performance CMOS sensors for demanding applications like X-ray, medical, scientific, and space-qualified imaging. This move further solidifies Hamamatsu Photonics' global capabilities in advanced photonics sensing.

IN DEPTH

Key Findings

Hamamatsu Photonics Europe has significantly bolstered its advanced imaging solutions by actively integrating and promoting Fairchild Imaging's cutting-edge CMOS image sensor technologies, following the acquisition completed in 2024. This strategic enhancement expands Hamamatsu's portfolio to encompass high-performance CMOS sensors for the most demanding applications, including X-ray imaging, medical diagnostics, scientific research, and space-qualified applications.

Technical / Clinical Details

- **Integration of Fairchild Imaging Technology:** Fairchild Imaging was highly regarded for its CMOS sensor technology, characterized by high resolution, high frame rates, and low noise characteristics. By combining this technology with its own optical expertise, Hamamatsu Photonics can now offer novel imaging solutions that were previously challenging with traditional CCD sensors.
- **Advantages of CMOS Sensors:** CMOS sensors surpass CCD sensors in terms of reduced power consumption, faster readout speeds, lower noise, and cost efficiency. These attributes offer significant benefits, particularly for real-time image processing and use in battery-powered devices.
- **Broad Application Spectrum:** The enhanced imaging solutions will be utilized across diverse fields:
  - **X-ray Imaging:** High-definition image acquisition for medical CT scans and non-destructive testing.
  - **Medical Imaging:** Improved accuracy in endoscopy, surgical assistance systems, and pathological diagnostics.
  - **Scientific Imaging:** High-sensitivity and high-speed data acquisition for astronomy, microscopy, and spectroscopy.
  - **Space-Qualified Applications:** Reliable performance in extreme environments for satellites and exploration probes.

Background & Context

The imaging market is increasingly demanding faster, more sensitive, higher-resolution, and lower-cost sensors, driven by advancements in AI and automation. In the medical field, precise and detailed image information is crucial for early diagnosis and accurate treatment. Hamamatsu Photonics, with its long-standing reputation in photomultiplier tubes and photodetectors, recognizes that strengthening its CMOS sensor technology is a vital strategy to adapt to market changes and diversify its product portfolio. The acquisition and technological integration of Fairchild Imaging represent a strategic move to enhance competitiveness in this evolving market.

Strategic Significance & Outlook

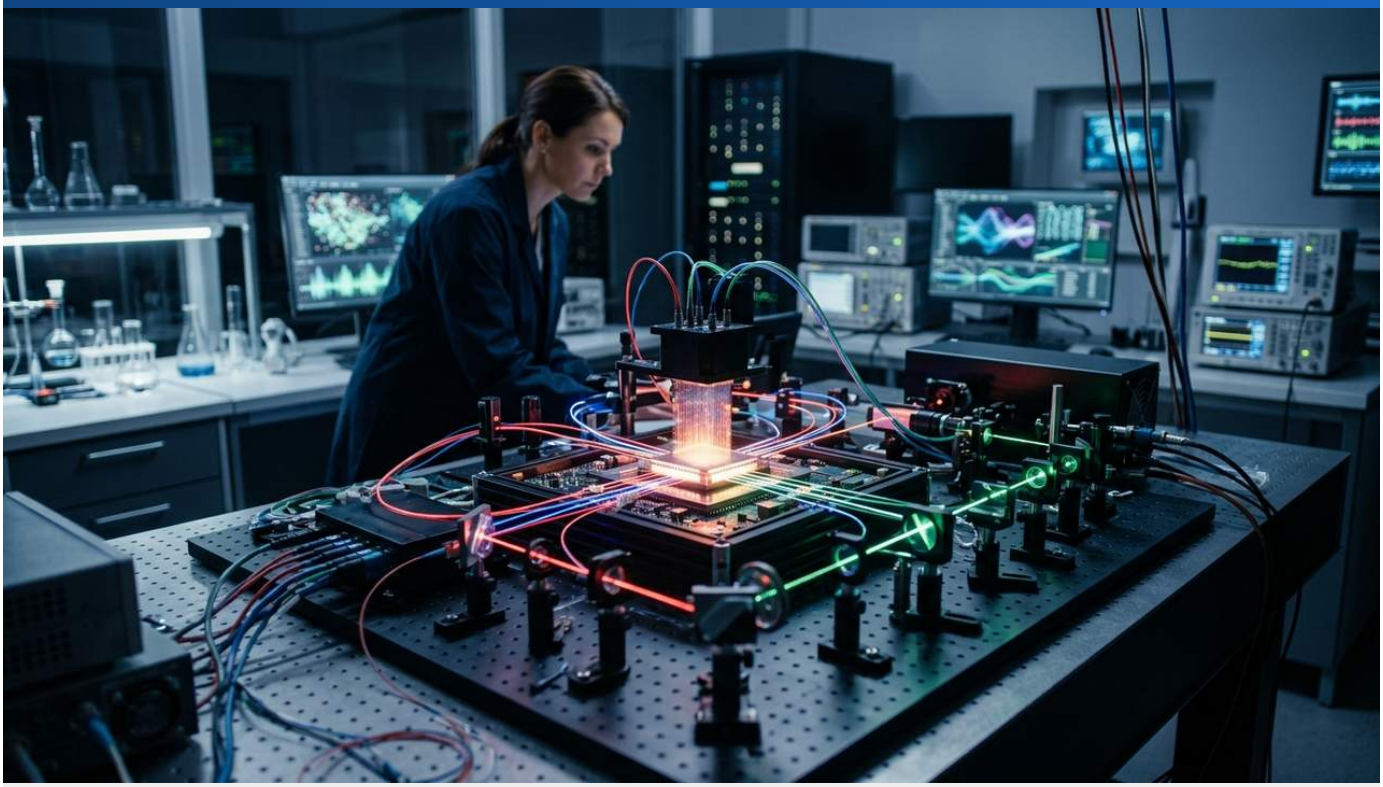
The reinforcement of advanced CMOS sensor technologies by Hamamatsu Photonics Europe will further solidify its global leadership in the photonics sensing sector. This technological evolution has the potential to improve imaging quality and efficiency across various industries, creating new applications that were previously unattainable. Specifically, it is expected to accelerate the development of more accurate AI-combined image analysis and compact, lightweight, high-performance imaging devices, driving innovation from diagnostic medicine to industrial inspection and space exploration. Hamamatsu Photonics will continue to play a crucial role in shaping the future of optical technology.

Source: https://electronics360.globalspec.com/article/24036/hamamatsu-photonics-europe-strengthens-advanced-imaging-solutions-with-fairchild-imaging-cmos-sensor-technologies

Collected: August 28, 2026 | Automated Research System (Gemini API)

#23 Optalysys Demonstrates Photonic Hardware for Compute-in-Transit, Revolutionizing AI and Cryptographic Workloads by Eliminating Data Movement Bottlenecks

Published August 21, 2026 Quantum Zeitgeist UK



OVERVIEW

Optalysys has demonstrated innovative photonic hardware capable of performing computations directly as data travels from storage. This 'in-transit computing' model addresses the critical data movement bottleneck in conventional computing systems, significantly enhancing the performance of AI and cryptographic workloads. It promises to reduce latency, bandwidth consumption, and energy use, potentially revolutionizing demanding applications like AI and fully homomorphic encryption.

IN DEPTH

Key Findings

Optalysys has successfully demonstrated a novel photonic hardware that performs computations directly while data is in transit between storage and processors. This pioneering 'compute-in-transit' paradigm offers a fundamental solution to the pervasive data movement bottleneck plaguing modern computing systems, particularly for AI and cryptographic workloads. This approach is expected to dramatically reduce processing latency, bandwidth constraints, and energy consumption, potentially revolutionizing demanding applications such as AI and fully homomorphic encryption (FHE).

Technical / Clinical Details

- **Principle of Compute-in-Transit:** Optalysys's technology leverages the physical properties of light to perform computations as data signals propagate. This involves passing light signals through specific optical elements that execute mathematical operations during transmission. In contrast, traditional electronic computing requires data to be moved from memory to CPU/GPU, computed, and then moved back, a process that consumes vast amounts of energy and time.
- **Advantages of Photonic Hardware:** Light propagates faster than electrons and can carry information with lower energy. Additionally, multiple light signals can pass through the same spatial medium without interfering, allowing for high parallelism. Optalysys's photonic hardware maximizes these characteristics to efficiently perform calculations commonly used in AI and cryptography, such as vector-matrix multiplications.
- **Target Workloads:** The technology is specifically aimed at computationally intensive applications like AI model inference and training, and fully homomorphic encryption (FHE), which demands high security. FHE, allowing computations on encrypted data for privacy preservation, has been hampered by high computational costs. Compute-in-transit holds the potential to address this challenge.

Background & Context

Modern data centers and AI systems are increasingly grappling with issues known as the 'memory wall' and 'data movement bottleneck.' This problem arises because the increase in processor speed far outpaces the improvements in data transfer rates and memory bandwidth, limiting overall system performance. This bottleneck leads to increased power consumption and reduced processing speeds, particularly for large-scale AI models and complex cryptographic algorithms. Optical computing is recognized as one of the most promising technologies globally for overcoming this critical bottleneck.

Strategic Significance & Outlook

Optalysys's compute-in-transit technology has the potential to revolutionize the fields of AI and cybersecurity. By fusing data movement and computation, AI model training and inference can be conducted faster and more energy-efficiently, opening new pathways for real-time AI applications. Moreover, a substantial reduction in FHE computational costs could accelerate the adoption of privacy-preserving computing across all sectors handling sensitive data, including finance, healthcare, and government. This technology represents a groundbreaking advancement capable of transforming data center design philosophies and redefining the future of computing.

Source: https://quantumzeitgeist.com/compute-data-travels-optalysys-aims/

Collected: August 28, 2026 | Automated Research System (Gemini API)

#24 Innoviz Highlights Growing Risks of Chinese Supply Chain Dependence for Automotive OEMs

Published Published August 25, 2026　Innoviz　イスラエル

OVERVIEW

A recent industry analysis, emphasized by Innoviz, issues a stark warning to automotive OEMs: over-reliance on China for their entire supply chain stack presents significant future risks. This report, while not explicitly detailing Innoviz's products, reflects broader industry concerns about supply chain diversification and geopolitical vulnerabilities, particularly for critical high-tech components like LiDAR. With autonomous driving technology's escalating strategic importance, the urgent need for robust, diversified international supply chains is increasingly evident.

IN DEPTH

Background

The automotive industry is currently experiencing profound transformation, propelled by the rise of autonomous driving, connected vehicles, and electrification. These trends have dramatically amplified the strategic importance of semiconductors and software. A significant portion of these advanced technologies are manufactured in specific regions, notably China, contributing to increased complexity and concentration within global supply chains. Concurrently, the escalating US-China tech rivalry and severe supply chain disruptions, epitomized by the COVID-19 pandemic, have acutely underscored the critical need for risk diversification for both enterprises and governments. As a leading innovator in LiDAR sensors, Innoviz offers profound insights into how these supply chain vulnerabilities can directly impede the widespread adoption of autonomous driving technologies.

Key Findings

An industry analysis, prominently highlighted by Innoviz, delivers a stark warning: Automotive Original Equipment Manufacturers (OEMs) are exposing themselves to substantial future risks by constructing their entire product development 'stack'—encompassing everything from initial design to the complete manufacturing supply chain—with an over-reliance on China. This revelation mirrors a widespread industry apprehension regarding the geopolitical, economic, and supply-side vulnerabilities inherent in highly concentrated sourcing from a single geographical region.

Technical Details

- **Supply Chain Concentration Risk:** The global automotive industry operates on highly interconnected supply chains, yet exhibits a significant concentration of production in specific regions, especially for high-tech components like LiDAR—essential for Advanced Driver-Assistance Systems (ADAS) and full autonomous driving. Excessive dependence on China exacerbates the risk of severe supply disruptions stemming from unforeseen events such as trade conflicts, escalating geopolitical tensions, global pandemics, or natural catastrophes.

- **Geopolitical Considerations:** Strategic technologies, including advanced semiconductors and sophisticated sensors, are inextricably linked to national security interests. Reliance on a single nation for these critical inputs can introduce profound challenges regarding supplier reliability and potential restrictions on technology access. Such constraints could severely impact product launch schedules and decelerate the overall pace of technological innovation.
- **Necessity for Diversification:** The analysis strongly advocates for automotive OEMs to proactively diversify their procurement sources and expand their geographical manufacturing footprints. This strategic approach is crucial for enhancing overall supply chain resilience, distributing risks effectively, and ensuring a robust and stable supply framework for future development.

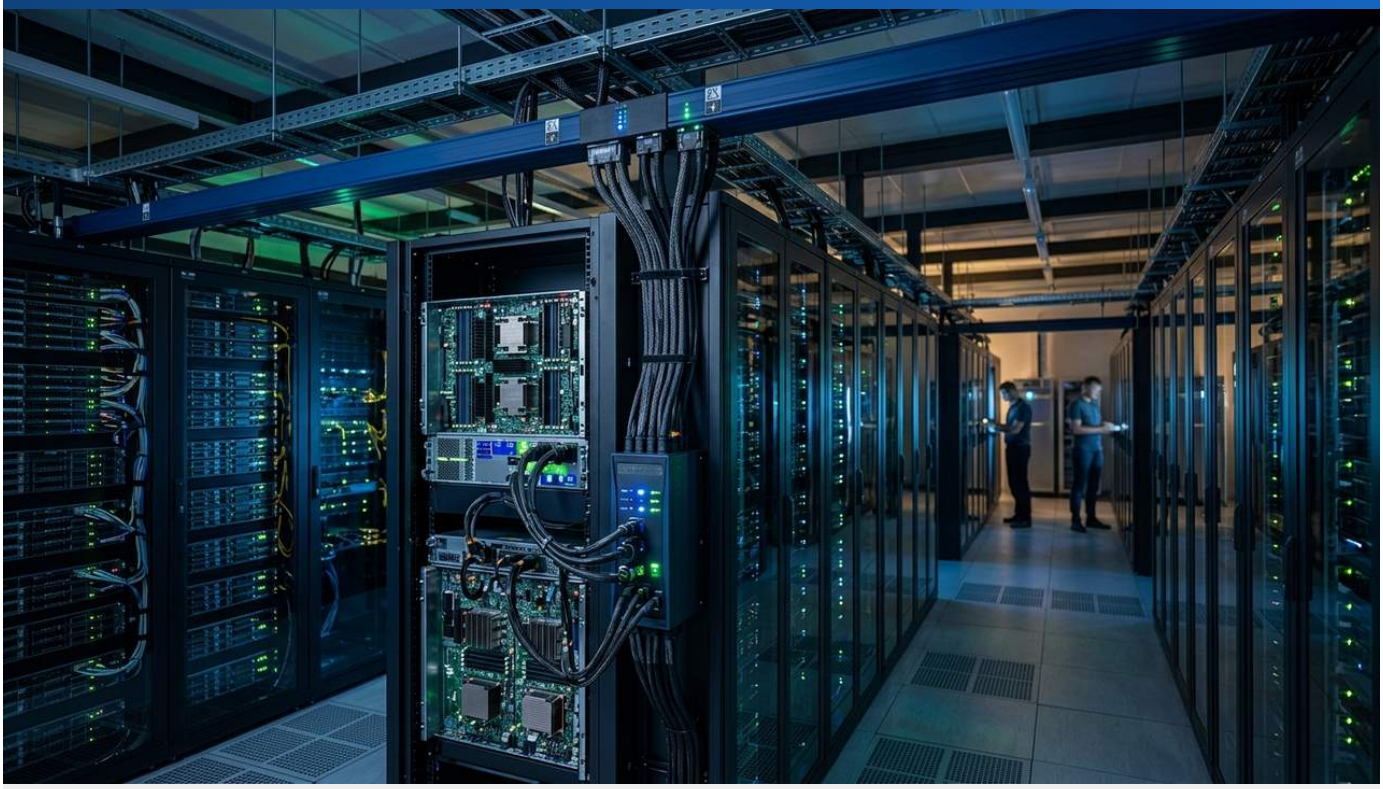
Strategic Significance & Outlook

Excessive dependence by automotive OEMs on Chinese supply chains poses a severe long-term threat to their competitiveness, supply stability, and even brand reputation. Consequently, the comprehensive restructuring and diversification of supply chains will become an urgent strategic imperative for the entire automotive sector. Specifically for critical optical sensing components like LiDAR, a rapid acceleration in securing multiple sourcing options and diversified production sites is anticipated. Companies such as Innoviz are poised to maintain their leadership in the global market by simultaneously building robust, resilient supply chains and safeguarding their technological edge. This overarching trend is expected to drive the formation of new international division-of-labor systems that explicitly integrate geopolitical risk considerations, thereby contributing to more sustainable industrial development.

Source: #

#25 GlobalFoundries Elevates Data Center Energy Efficiency with Strategic 48V Power Delivery Approach

Published August 20, 2026 GlobalFoundries USA



OVERVIEW

GlobalFoundries has outlined a strategic approach to 48V power delivery in its Insights blog, aiming to enhance energy efficiency in data centers and high-performance computing (HPC). While not directly photonic-specific, this initiative provides the stable power foundation necessary for the large-scale deployment of silicon photonics and Co-Packaged Optics (CPO) within AI infrastructure. Improved power efficiency significantly contributes to reduced operational costs and sustainability in AI data centers.

IN DEPTH

Key Findings

GlobalFoundries, through its 'Insights' blog, has presented its perspective on a strategic approach to 48V power delivery, aiming to fundamentally improve energy efficiency in data centers and high-performance computing (HPC) systems. This strategy seeks to transform the power delivery infrastructure that underpins next-generation computing architectures, addressing the immense power demands of the AI era.

Technical / Clinical Details

- **Benefits of 48V Power Delivery:** Compared to conventional 12V systems, 48V power delivery can significantly reduce power loss. Transmitting power at a higher voltage reduces current for the same power level, thereby decreasing I^2R losses (Joule heating) and improving the efficiency of wiring and connectors. This leads to enhanced overall data center power efficiency and reduced operating costs.
- **Optimized Power Distribution:** GlobalFoundries focuses on technologies that optimize power distribution efficiency from the chip level to the rack level. This includes improving the efficiency of voltage regulator modules (VRMs) and shortening the power delivery path to processors.
- **Relevance to AI Infrastructure:** AI and HPC workloads involve extremely high power consumption. 48V power delivery is essential for efficiently supplying stable and clean power to these systems, forming a foundational element for the deployment of large-scale AI supercomputing clusters.
- **Indirect Contribution to Silicon Photonics:** While silicon photonics and co-packaged optics (CPO) are crucial for addressing data transfer bottlenecks and power efficiency issues in data centers, these optical devices themselves rely on efficient electronic control circuits and stable power delivery. Improvements in 48V power delivery enhance the power performance of the entire system, including optical components.

Background & Context

Data center energy consumption is increasing year over year, posing significant challenges for both environmental impact and operational costs. The advancement of AI, in particular, demands ever-increasing computational resources and associated power supply, exposing the limits of existing power infrastructures. Therefore, transitioning to more efficient power delivery architectures is an urgent industry-wide challenge. When foundries like GlobalFoundries extend their expertise beyond mere chip manufacturing to include power delivery solutions, it adds significant value to the entire semiconductor ecosystem.Strategic Significance & Outlook

GlobalFoundries' approach to 48V power delivery will significantly impact the design of next-generation data centers and AI infrastructure. Enhanced power efficiency will not only reduce operational costs but also contribute to sustainable IT operations. As optical technologies like silicon photonics and CPO are integrated with power-efficient processors, the balance between data center performance and environmental impact will be optimized. The evolution of this foundational technology is indispensable for enabling further AI advancements and realizing the training and inference of even larger and more complex models. GlobalFoundries is increasing its presence as a key player supporting the sustainable future of data centers, extending beyond the traditional scope of semiconductor manufacturing.

Source: #

#26 GUSS Automation Selects Ouster Rev8 OS0 Digital LiDAR Sensors for Next-Generation Autonomous Orchard Fleet

Published August 26, 2026 Ouster USA

OVERVIEW

John Deere's subsidiary, GUSS Automation, announced the integration of Ouster's Rev8 OS0 digital LiDAR sensors into its next-generation autonomous orchard machines. This strategic partnership aims to achieve high-precision navigation and obstacle detection in complex agricultural environments. Ouster's LiDAR technology exemplifies the continuous adoption and industrialization of LiDAR in robotics and autonomous systems, promising significant improvements in agricultural machinery safety and efficiency.

IN DEPTH

Key Findings

GUSS Automation, a subsidiary of John Deere, has announced its decision to integrate Ouster's latest Rev8 OS0 digital LiDAR sensors into its next-generation autonomous orchard machines. This partnership marks a significant milestone, illustrating the extensive adoption and deepening industrial application of LiDAR technology within the agricultural robotics and autonomous systems sector.

Technical / Clinical Details

- **Ouster Rev8 OS0 Digital LiDAR Sensor:** The OS0 sensor is a flagship product in Ouster's lineup, characterized by its high-performance digital LiDAR technology. The Rev8 iteration offers higher resolution and broader range 3D point cloud data, enabling reliable environmental perception even under challenging conditions. Its digital architecture contributes to superior reliability and ease of manufacturing.
- **Integration into Autonomous Orchard Machines:** GUSS Automation's autonomous orchard machines are designed to automate tasks such as spraying and management in orchards. Accurate environmental perception is crucial for these machines to operate safely and efficiently amidst complex tree rows, uneven terrain, and variable environmental factors (e.g., sunlight, shadows, dust). The OS0 sensor provides the necessary 3D mapping and obstacle detection capabilities to address these challenges.
- **Enhanced Navigation and Obstacle Detection:** LiDAR sensors continuously scan the vehicle's surroundings in real-time, generating 3D point cloud data with precise distance information. This allows the machines to accurately determine their position, detect obstacles such as trees, equipment, and personnel, and autonomously navigate optimal paths while avoiding collisions.
- **Expansion into Industrial Applications:** This partnership demonstrates that LiDAR technology is not confined to the automotive sector but is becoming an indispensable tool for driving autonomy in a wider range of industrial fields, including agriculture, construction, and logistics.

Background & Context

The agricultural sector is rapidly adopting autonomous machinery due to labor shortages and the increasing demand for efficiency. Major corporations like John Deere, through GUSS Automation, are actively investing in this area, signaling significant market potential. LiDAR technology is particularly valuable in complex outdoor environments for autonomous systems because it maintains stable performance during nighttime operations and under conditions like dust or fog, where cameras or GPS alone might struggle.

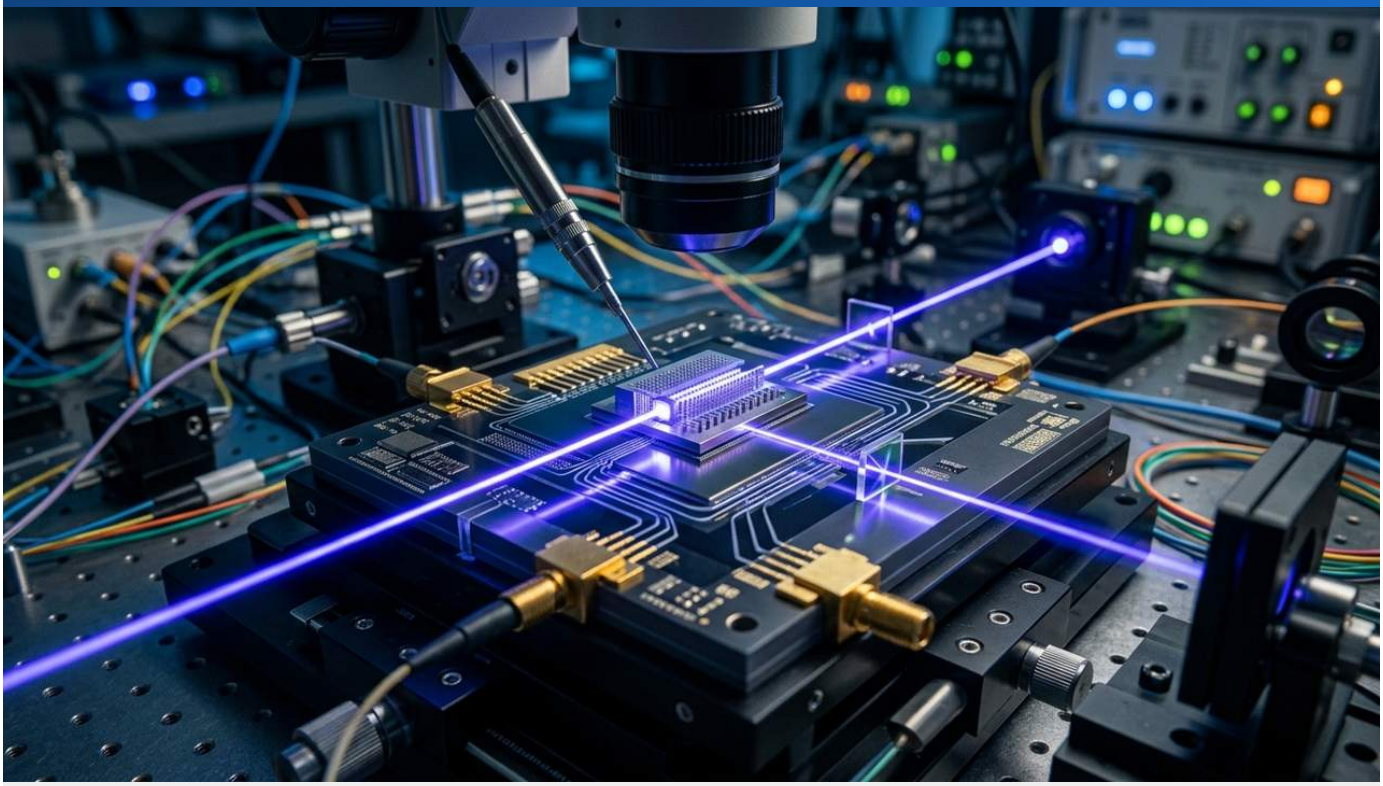
Strategic Significance & Outlook

The collaboration between GUSS Automation and Ouster represents a crucial step in shaping the future of precision agriculture. Autonomous orchard machines equipped with Ouster's LiDAR sensors will accelerate task automation, enhance the efficiency and accuracy of farm operations, and ultimately contribute to increased agricultural productivity and cost reduction. This success story is likely to encourage other agricultural machinery manufacturers and heavy equipment makers to adopt LiDAR technology, thereby accelerating the digital transformation of the entire agricultural sector. The continuous evolution and industrial proliferation of LiDAR technology will remain an indispensable component in the widespread deployment of robotics and autonomous systems.

Source: https://ouster.com/press-release/guss-automation-selects-ouster-rev8-os0-lidar-sensors-for-next-generation-autonomous-orchard-fleet/

#27 Compact On-Chip BIC Lasers Deliver High Purity Linearly Polarized Light, Accelerating Optical Computing and Quantum Photonics

Published August 21, 2026 Photonics Spectra USA



OVERVIEW

Compact BIC (Bound States in the Continuum) lasers have been developed, capable of directly supplying high-purity, linearly polarized light on-chip. This groundbreaking on-chip laser technology marks a significant advancement for integrated photonics, poised to profoundly impact optical computing, quantum photonics, and advanced sensing fields. By enabling more efficient and compact light sources, it contributes to overall system performance enhancement and miniaturization.

IN DEPTH

Key Findings

In a significant breakthrough for photonics, compact BIC (Bound States in the Continuum) lasers have been developed that can directly generate high-purity, linearly polarized light on-chip. This innovative on-chip laser technology is poised to dramatically simplify the design and application of integrated photonics, representing a crucial step towards the realization of advanced optical computing and quantum technologies.

Technical / Clinical Details

- **Principle of BIC Lasers:** BIC lasers leverage the quantum physical phenomenon of 'Bound States in the Continuum' to generate confined light within an otherwise open continuous spectrum. This allows for the creation of high-Q (quality factor) resonators with extremely narrow linewidths, even in open systems where light typically dissipates easily. This property significantly enhances laser oscillation efficiency and the quality of the output light (high-purity linear polarization).
- **Benefits of On-Chip Integration:** Directly integrating the laser onto a chip eliminates optical losses and complexities associated with external connections, enabling system miniaturization and increased efficiency. This offers a cost-effective and robust alternative to traditional bulky and expensive laser systems.
- **High-Purity Linear Polarization:** The polarization state of light plays a critical role in numerous applications, including optical communication, quantum information, and sensing. In quantum photonics, precise control over the polarization of photons used as qubits is essential. On-chip delivery of high-purity linearly polarized light directly improves the performance of quantum circuits.

Background & Context

Integrated photonics, the technology of integrating optical circuits onto semiconductor chips, is driving innovation across various fields such as data communication, sensing, medical technology, and quantum computing. However, integrating high-performance laser light sources onto a chip has been a major challenge. Specifically, the ability to efficiently and compactly generate light with a precise polarization state is indispensable for the advancement of next-generation optical computing and quantum computing. The development of BIC lasers addresses this bottleneck, enabling the realization of more complex and functional optical integrated circuits.

Strategic Significance & Outlook

The development of this compact BIC laser will have a profound impact on the fields of optical computing and quantum photonics. The availability of highly efficient and stable on-chip light sources will improve the performance of optical AI accelerators and facilitate the miniaturization and scalability of quantum circuits for generating and controlling qubits. It also has the potential to enhance the accuracy of sensitive optical sensing devices and medical diagnostic instruments. In the future, this technology is expected to find applications across a wide range of areas, from optical interconnects in data centers to new types of quantum sensors and advanced optical functionalities in consumer devices, accelerating the further proliferation and evolution of photonics technology.

Source: #