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Quantum Photonic Neural Network Market to Reach USD $5.69 Billion by 2029 at 33.7% CAGR

The Business Research Company's Quantum Photonic Neural Network Global Market Report 2025 – Market Size, Trends, And Global Forecast 2025-2034

LONDON, GREATER LONDON, UNITED KINGDOM, October 2, 2025 /EINPresswire.com/ -- How Big Is The [Quantum Photonic Neural Network Market](#) In 2025?

The Business Research Company

The market size of quantum photonic neural networks has experienced exceptional growth in recent times. Beginning with a value of $1.33 billion in 2024, it is projected to develop to $1.78 billion by 2025, with an impressive compound annual growth rate (CAGR) of 34.1%. This previous period's growth is linked to factors such as increased government funding, the escalating interest in quantum computing, the necessity for secure communication channels, the requirement for swift data processing, and the expansion of quantum computing-as-a-service offerings.

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The market for quantum photonic neural networks is predicted to experience significant expansion in the coming years, with an estimated value of $5.69 billion by 2029, reflecting a compound annual growth rate (CAGR) of 33.7%. Several factors drive this anticipated growth during the forecast period. These include the burgeoning demand for artificial intelligence applications, the need for more secure communication systems, the rise in data center infrastructure, the requirement for more scalable computing solutions, and the development of quantum cloud services. Noteworthy emerging trends during this forecast period encompass the incorporation of quantum photonics into AI, advances in photonic integration, embracing photonic quantum computing, the evolution of quantum-improved sensors, and the miniaturization of photonic apparatus.

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What Are The Key Driving Factors For The Growth Of The Quantum Photonic Neural Network Market?
The quantum photonic neural network market is projected to grow due to an increase in cyber threats and concerns about data privacy. Unauthorised digital intrusions, data breaches, and misuse of sensitive information that harm individuals and organisations are all part of these concerns. The fast-paced digitalisation and use of connected technologies have expanded the attack surface and heightened critical system vulnerabilities, fuelling these cyber threats and worries about data privacy. Quantum photonic neural networks, which utilise quantum computing and photonics principles, are helping to strengthen cybersecurity through ultra-fast and extremely secure data processing and advanced threat detection, thus tackling key data privacy issues. For example, the Australia-based government agency Australian Signals Directorate reported in November 2023 that during the 2022-23 fiscal year, ReportCyber received almost 94,000 reports of cybercrime, a 23% increase from the previous year, with an average of one report filed every six minutes. As a result, the upsurge in cyber threats and data privacy issues is propelling the quantum photonic neural network market's growth.

Who Are The Key Players In The Quantum Photonic Neural Network Industry?
Major players in the Quantum Photonic Neural Network Global Market Report 2025 include:
• Lightmatter Inc.
• PsiQuantum Corp.
• Q.Ant GmbH
• Quantum Brilliance Pty Ltd
• Xanadu Quantum Technologies Inc.
• Photonic Inc.
• HyperLight Corporation
• Quandela SAS
• Salience Labs Ltd.
• TensorFlow

What Are The Prominent Trends In The Quantum Photonic Neural Network Market?
Key players in the quantum photonic neural network market are prioritizing the incorporation of cutting-edge technologies such as processing by integrated graphics processing units (GPUs) to hasten quantum-classical computations and boost model performance. Processing with integrated GPUs is about employing an in-built GPU in a system for intricate computations, thus facilitating high-speed calculations, parallel processing, and quantum-classical operations, which enhances overall system performance and effectiveness. For instance, Orca Computing Limited, a British quantum computing firm, in October 2024, rolled out PT-2, the newest system in their PT Series of photonic quantum computers. The PT-2 fuses photonic quantum processors with top-notch GPU processing, paving the way for quantum-boosted generative artificial intelligence (AI) and quantum-classical neural network operations. This system aids companies in speeding

up intricate computations in areas such as chemical formulation, vaccine creation, and optimization issues, providing a commercially feasible platform for quantum AI applications on an industrial scale.

What Segments Are Covered In The Quantum Photonic Neural Network Market Report?
The quantum photonic neural network market covered in this report is segmented

1) By Component: Hardware, Software, Services
2) By Deployment Mode: On-Premises, Cloud
3) By Application: Healthcare, Finance, Telecommunications, Defense, Research And Development, Other Applications
4) By End-User: Academic And Research Institutes, Enterprises, Government, Other End Users

Subsegments:
1) By Hardware: Processors, Memory, Interconnects, Photonic Chips, Optical Modulators, Detectors, Waveguides, Integrated Circuits
2) By Software: Simulation Tools, Training Platforms, Optimization Algorithms, Middleware, Programming Frameworks, Data Processing Tools
3) By Services: Consulting, Integration, Deployment, Maintenance, Support, Training, Managed Services

View the full quantum photonic neural network market report:
https://www.thebusinessresearchcompany.com/report/quantum-photonic-neural-network-global-market-report

Which Region Is Expected To Lead The Quantum Photonic Neural Network Market By 2025?
In the Quantum Photonic Neural Network Global Market Report 2025, North America is identified as the leading region for the stated year. The most robust growth over the forecast period, however, is anticipated in the Asia-Pacific region. The report offers coverage of diverse regions which include Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East, and Africa.

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