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ANNOUNCEMENT

**The School of Informatics of Aristotle University Builds Photonic
Artificial Intelligence Processor with the World's Highest
Computational Power!**

Thessaloniki, 9/12/2025

The world's most powerful Artificial Intelligence tensor core operates with light and carries a Greek signature. The School of Informatics of Aristotle University, following the development of the fastest Artificial Intelligence tensor core that was announced about two years ago, has recently deployed a photonic Artificial Intelligence tensor core that offers the highest computational power that has been reported so far worldwide among all state-of-the-art fully programmable AI tensor cores!

This tensor core employs photonic neurons and operates with light instead of electric current, implementing a novel architecture that can, for the first time, perform algebraic operations at high speeds by exploiting multiplexing along three dimensions: time, space, and wavelength. In this way, it achieved a total computational power of 262 TOPS (262×10^{12} operations per second), a record-breaking figure among all programmable Artificial Intelligence cores: it is approximately 24 times higher than the corresponding performance of other experimental fully programmable photonic processor prototypes, and about 10 times higher than NVIDIA's most powerful Artificial Intelligence tensor core, the B200.

The research conducted at Aristotle University addresses one of the most significant current challenges in the field of photonic processors: their ability to support large Artificial Intelligence models.

This groundbreaking research in the field was based on the interdisciplinary collaboration of two research groups of the School of Informatics: the Wireless and Photonic Systems and Networks (WinPhoS) research group of the Centre for Interdisciplinary Research and Innovation (CIRI) of Aristotle University

(<http://winphos.web.auth.gr/>), led by Professor Nikos Pleros, and the Computational Intelligence and Deep Learning Research Group (CIDL) of the School of Informatics (<https://cidl.csd.auth.gr/>), led by Professor Anastasios Tefas, with key collaborator Assistant Professor Nikolaos Passalis of the School of Chemical Engineering.

It is worth noting that the main researcher, Mr. Christos Pappas, was recently distinguished for this work by the IEEE Photonics Society as one of the top 10 PhD candidates worldwide for 2025, receiving the 2025 Photonics Society Graduate Student Scholarship. Furthermore, Dr. Apostolos Tsakyridis was invited to present the results of this research at the Optical Fiber Communication Conference (OFC) in March 2026 in Los Angeles, USA.

The collaboration between the two research teams of Aristotle University has attracted significant funding from numerous European Horizon and national research programs, as well as from the US start-up company Celestial AI, which is based in Silicon Valley, California, and has been recently acquired by Marvell.

More information: <https://doi.org/10.1063/5.0271374>

Attached Photographs: (1) Members of the research team of the School of Informatics conducting the experimental implementation for the photonic Artificial Intelligence processor. From left: PhD candidates Antonis Prapas, Moschos Theodoros, Odysseas Asimopoulos.

(2) Members of the research team of the School of Informatics who developed the photonic Artificial Intelligence processor. From left: standing Assistant Professor Nikolaos Passalis, Professor Nikos Pleros, Professor Anastasios Tefas; seated Christos Pappas, Dr. Miltiadis Moralis-Pegios, Dr. Apostolos Tsakyridis, Dr. Georgios Giamougiannis, and Dr. Manos Kirtas.

We kindly request that this event be published, broadcast, and covered by the media.