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Photonic Integrated Circuits: from Pilot Line Access to Product

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Research and industrialization of photonic integrated circuit (PIC) technology are both gaining momentum around the world. Optical communication in data centers, including high-performance computing (HPC) and artificial intelligence (AI) systems, is clearly the biggest application domain for PICs. Data center transceivers typically operate at ~ 1.3 or ~ 1.55 μm wavelengths, while requiring large bandwidth, low-cost mass production and low power consumption. However, there are also many other promising use cases for PICs, such as various optical sensors and imaging systems for healthcare, automotive, civil engineering and defence applications, as well as photonic and quantum computing. Some of these have totally different requirements, such as operation in other wavelength ranges (between ultraviolet and mid-infrared), ultra-broadband operation, ultra-low losses, low noise or very high optical power. Thus, no single PIC technology can cover all application needs and the entire optical spectrum. This presentation will review a variety of complementary PIC technologies and compare their ability to address different application needs. Access to these technologies via PIXEurope pilot line and the PhotonHub innovation hub will then be described and followed by a discussion about potential paths to volume production.