# The exponential growth of photonic integration technology

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**Abstract:**

Photonic integrated circuits, also known as optical chips, integrate multiple optical components and functionalities on a single piece of semiconductor, typically silicon or indium phosphide. The technology of optical chips is maturing fast, driven by high-bandwidth communications applications, and mature fabrication facilities. State of the art commercial optical chips integrate hundreds of components, such as lasers, detectors, modulators, and filters, whereas laboratory demonstrators show integration levels of thousands of components. For almost three decades, this increase in optical chip complexity has been doubling every two years, much like Moore's Law for electronic integrated circuits.
I will discuss the state of the art in this technology and the opportunities for both fundamental and applied research.