

## **Silicon Integrated Photonics at IBM**

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The current tendency in high performance computing systems is to increase the parallelism in processing at all levels utilizing multithreads, increasing the number of chips in racks and blades, as well as increasing the number of cores on a chip.

As it already happened in long-haul communications decades ago when optical fibers replaced copper cables, the copper cables that connect racks in the datacenters are started now to being replaced by optical fibers. Following the same trend optics can become competitive with copper at shorter and shorter distances eventually leading to optical on-board and even on-chip communications.

At IBM, silicon photonics circuits are being developed to enable the integration of complete optical systems on a monolithic semiconductor chip that would eventually allow to overcome the constraints of today's mostly copper I/O interconnects. In this presentation I will describe the work at IBM on components for such an on-chip optical system and discuss the challenges arising in building these components.