

PL-1 (Plenary)

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Abstract:

The silicon chip has been the mainstay of the electronics industry for the last 40 years and has revolutionized the way the world operates. Today a silicon chip the size of a fingernail contains nearly one billion transistors and has the computing power that only a decade ago would take up an entire room of servers. Silicon photonics that mainly based upon silicon on insulator (SOI) has recently attracted a great deal of attention since it offers an opportunity for low cost opto-electronic solutions for applications ranging from telecommunications down to chip-to-chip interconnects as well as possible applications in new emerging areas such as optical sensing and or bio-medical applications.

Recent advances and research breakthroughs in silicon photonic device performance over last few years have shown that silicon can be considered as a material onto which one can build future optical devices. While significant efforts are needed to improve device performance and to “commercialize” these technologies, progress is moving at a rapid rate. If successful, silicon photonics may similarly come to dominate the optical communications as it has the electronics industry.

The presentation will provide overview of silicon photonics research at Intel Corporation, describe some of the recent advances in device performance and discuss the key building blocks needed for “siliconizing” photonics. In addition the presentation will provide an overview and discussion on the potential applications and future opportunities for silicon photonics. Finally the presentation will discuss some of the practical issues and challenges with processing silicon photonic devices in a high volume CMOS manufacturing environment.