

Motivation

Monolithic electronic-photonic convergence based on silicon electronic technology

- Compact integration of fast data transmission (photonics) and high performance data processing (electronics).
- Low-cost fabrication of ultra-compact low-power EPICs with industrialized silicon micro-fabrication technologies.

Originality

First successful ultra-small photonic devices with CMOS-compatible silicon nanotechnology.

- Low-loss silicon photonic wire waveguide
- Ultra-compact wavelength filters
- Fast manipulation of light using E-P convergent (PIN) devices
- All optical wavelength conversion and switching based on nonlinear optical effects

Impact

Ubiquitous and commodity applications of ultra-fast optical networks

- Ultra-fast home electronics, low-cost remote medical care...

Ultrahigh-performance parallel computing using on-chip optical interconnection

- Entertainment equipment with ultra-fine image processing
- Supercomputers for global environment prediction

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