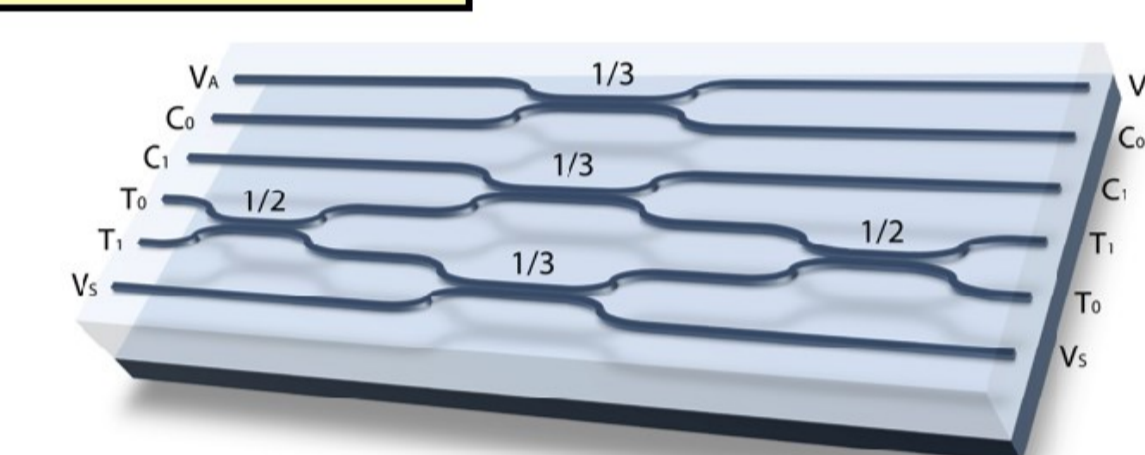
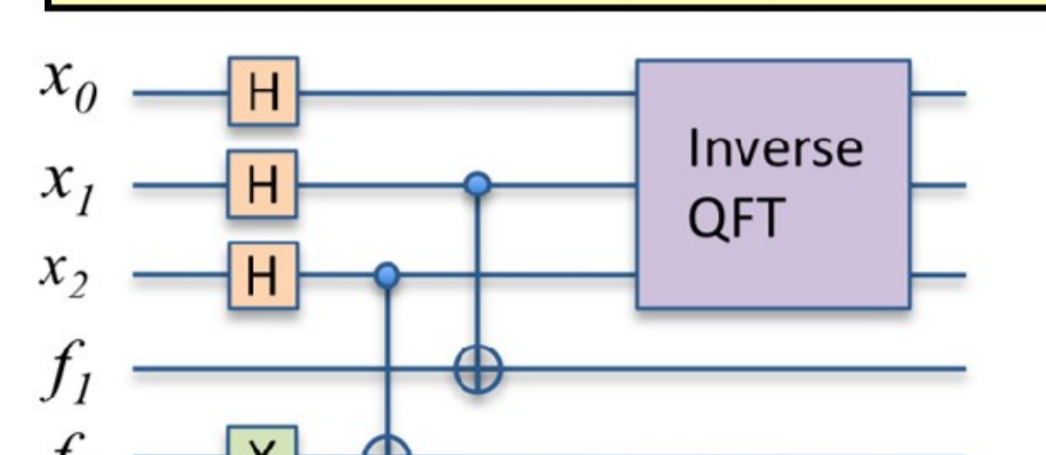


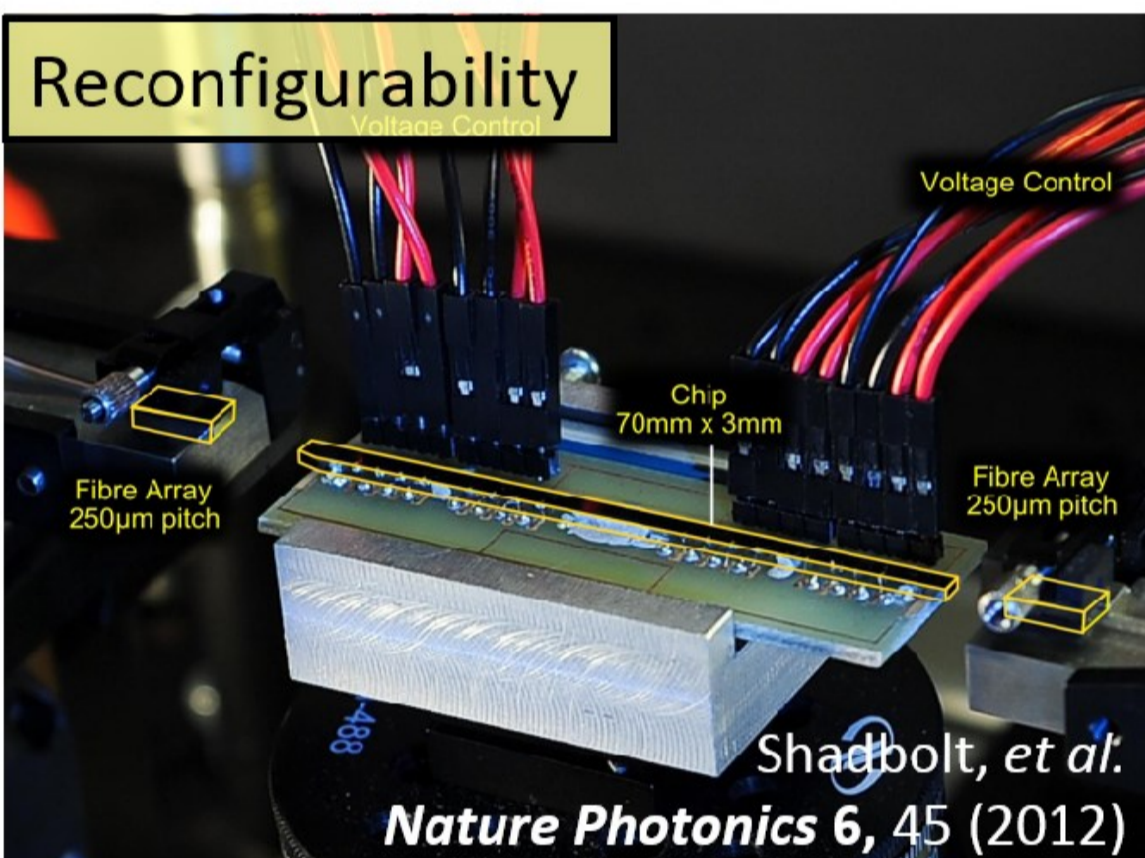
CNOT gate



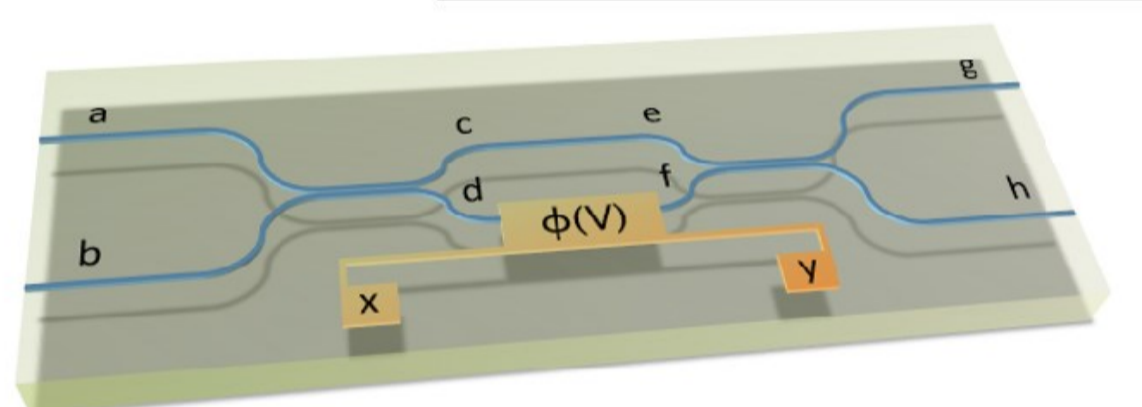
Shor's Factoring Algorithm



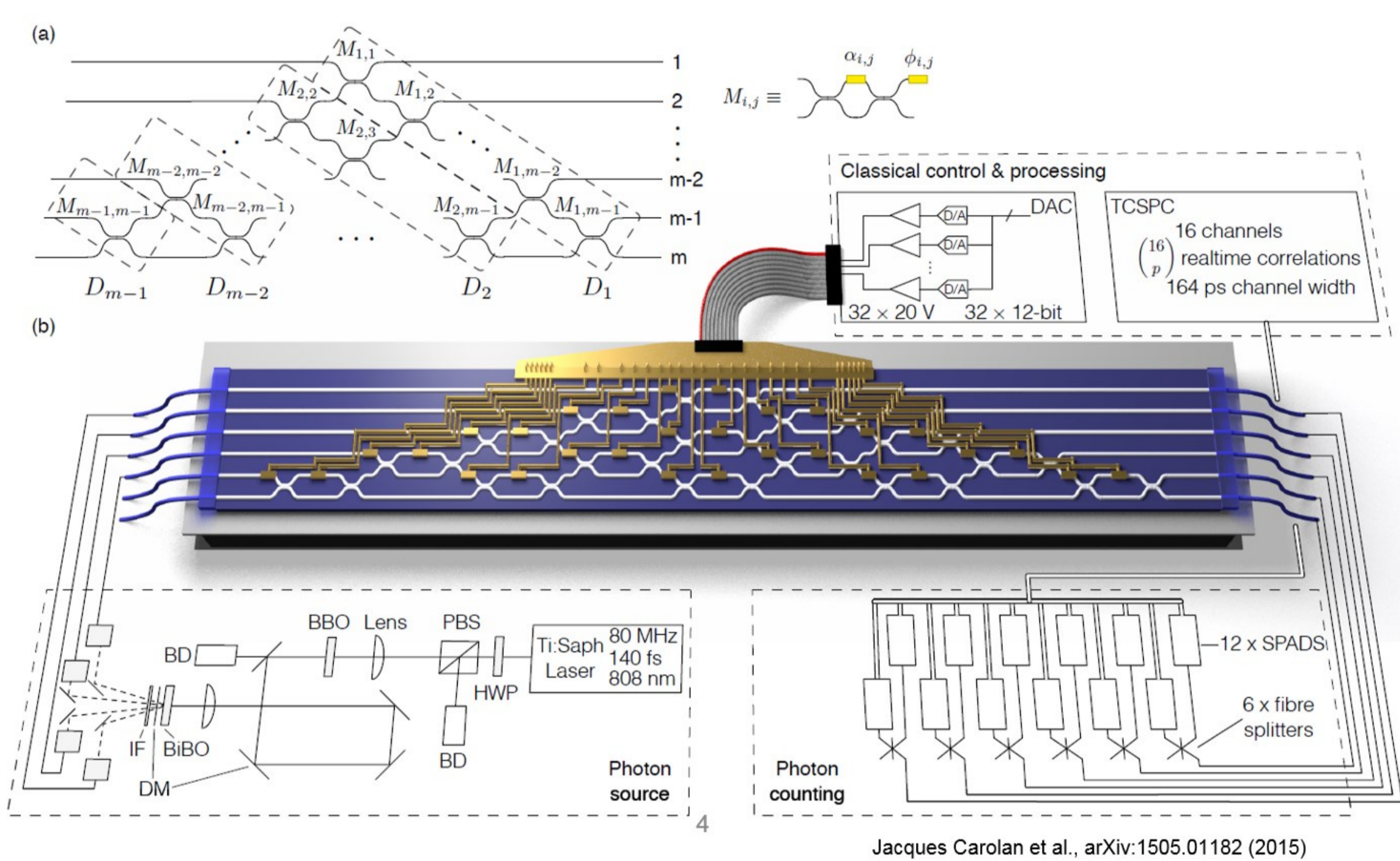
Reconfigurability



1-Qubit operations



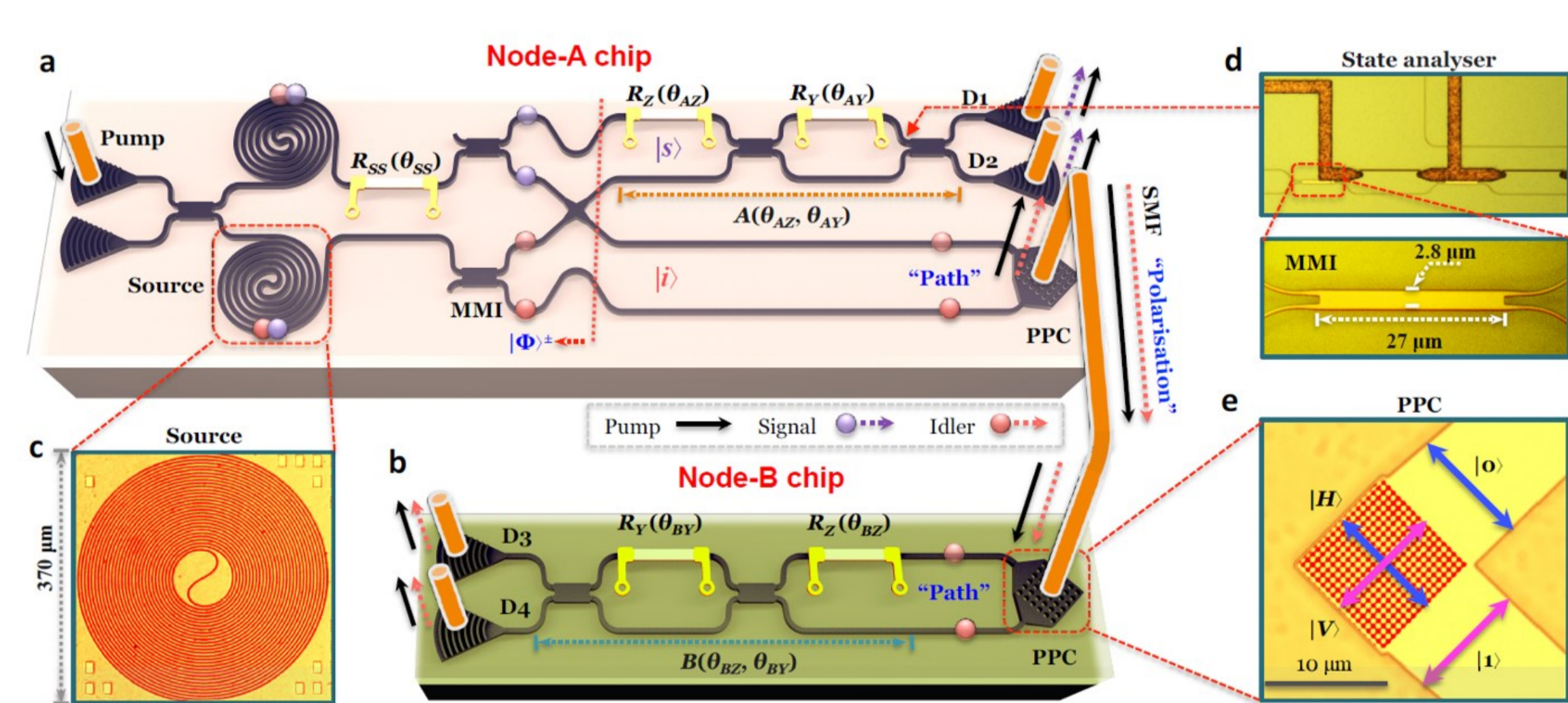
Universal Linear Optics



Silicon Integrated Photonics

nature photonics
Science
SiO₂
IBM Silicon Photonics 200 nm
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Beyond a single chip



Detectors

Natarajan, Peruzzo, Miki, Sasaki, Wang, Baek, Nam, Hadfield O'Brien
Capacitor
Inductor
Current Source
Amplifiers
RF Signal
Gnd
4nm
110nm
3µm
500µm
Silicon Waveguide
Buried Oxide
SiN
Intensity
Direction of Propagation
W. Pernice et al

Z: 193.0nm
X: 5.0µm
A. Fiore et al

OCLARO

Fiber to the home
WDM receiver
WDM transmitter
Optical switching
4x4 space and wavelength selective switch
Fast optical switch matrix
Optical data handling
All optical regenerator for short haul WDM signals
ROADM crossbar
Pulse shaper
Fiber Bragg Grating resonator
Fiber Bragg Grating resonator
Fiber sensor readout
Optical strain sensor readout
Medical and bio-imaging
Pulse shaper for bio-imaging
Integrated tunable laser for optical coherence tomography
THz Optical to RF converter
DPDK receiver
Variety of lasers
Widely tunable ring laser
Variable repetition rate pulsed laser
Pulsed fiber laser
High power multi-wavelength laser
Tunable laser with integrated MZ modulator
DPDK receiver

(a) P. MOD PH. RAND I.M
LASER PH. ENC T-DEL
L-BAL
TBS PH. DEC SPDs