Fiber Optic Communications
Lecture 12: On-Chip Interconnects

- Guided Wave Interconnects
- Photonic Crystals
- Photonic Waveguides
- Photonic Slabs
Couplers

Integrated couplers

(a) T-coupler
(b) 3-dB coupler
(c) Star coupler

Fiber couplers

Double-core fiber

(a) T-coupler
(b) 3-dB coupler
(c) Star coupler
(d) Star coupler
On-chip interconnects

• Advantages of on-chip optical interconnects
  – High speed
  – Low power
  – High density
Optical interconnects

Chip-to-chip interconnects

External reflection hologram interconnects
Integration

- Hybrid integration: flip-chip bonding
  - bonding silicon CMOS chip with photonics chip