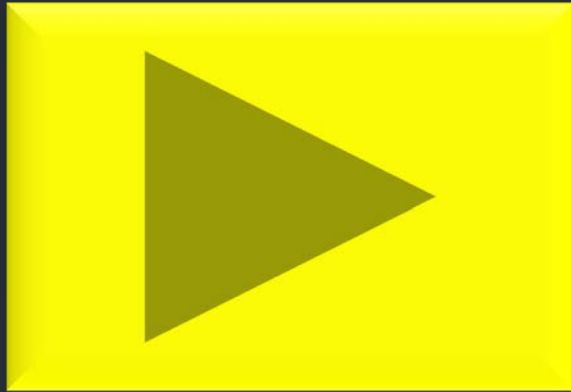


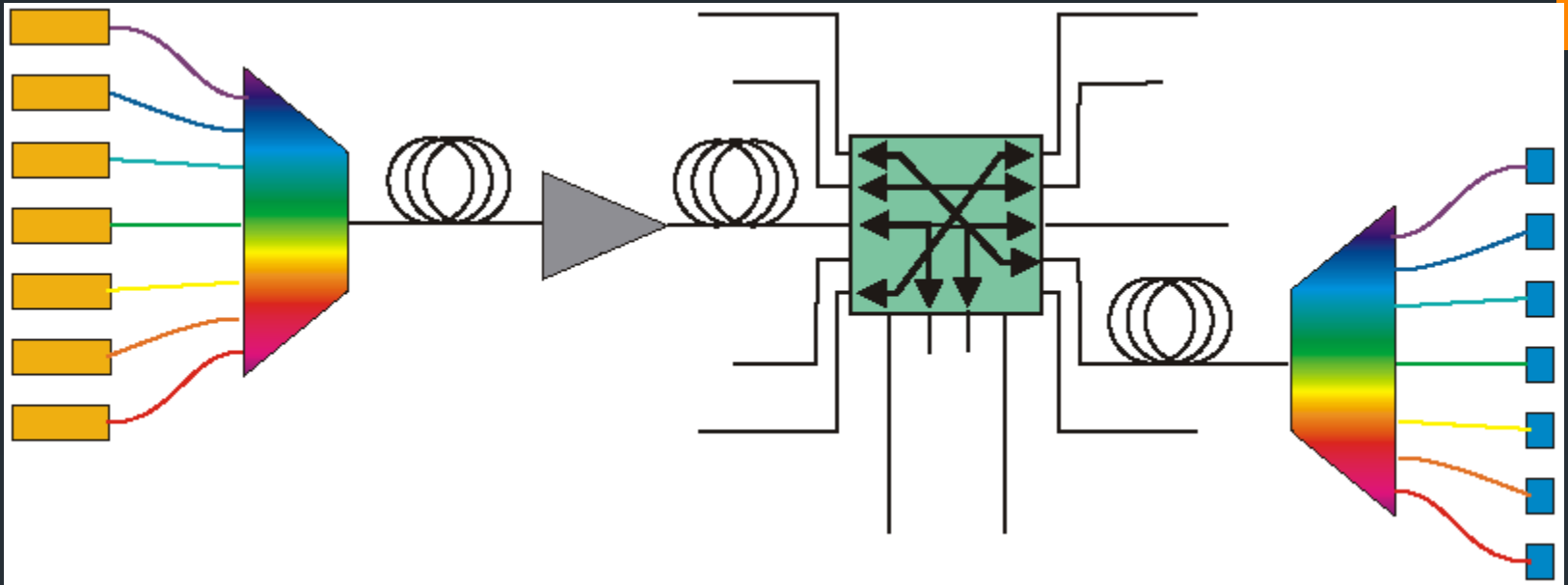


Introduction

- Optoelectronics is an engineering discipline of technology involving light (optics) and electronics
- The technology is primarily about devices; but system performance is the driving force
- In the last decade, it has grown beyond “traditional” optoelectronics, and embraced the broader discipline of light wave devices: this is photonics



Enabling technology for optical communication



Transmitter

WDMux

Fiber

Optical amplifier

Optical switch

Receiver

- Laser
- DFB, [DBR](#), VCSEL
- Tunable, fiber

- TF filters
- Fiber Bragg G
- Array waveguide grating
- Diffraction G
- Other gratings

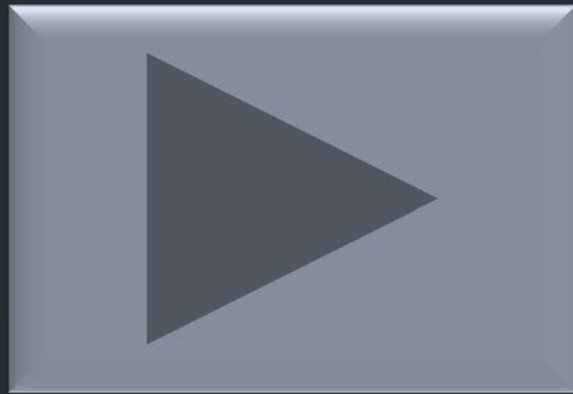
- Modulator
- Electro-optic
- Electroabsorption

- Erbium-doped Fib. Amp (EDFA)
- Semicond. (SOA)
- Others (Raman)

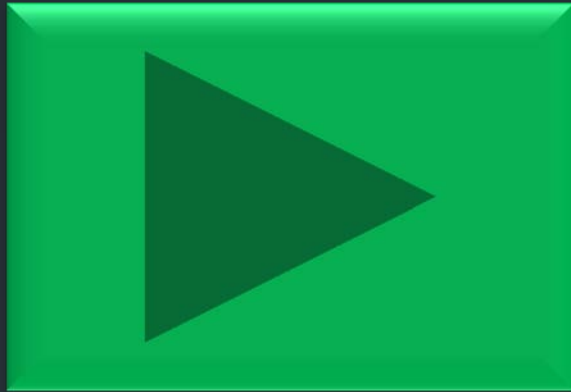
- Path switch
- Add/Drop mux
- λ -router
- Cross connect
- Couplers
- circulators

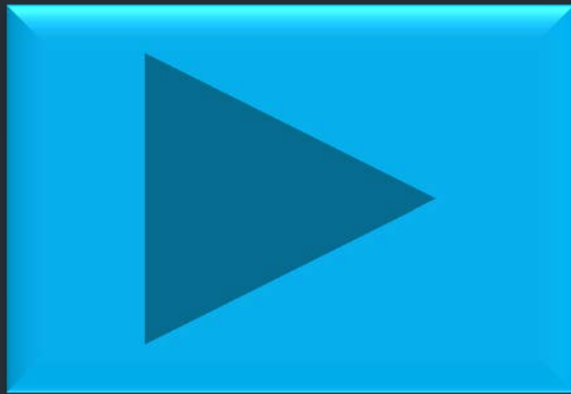
- Ultrafast PD

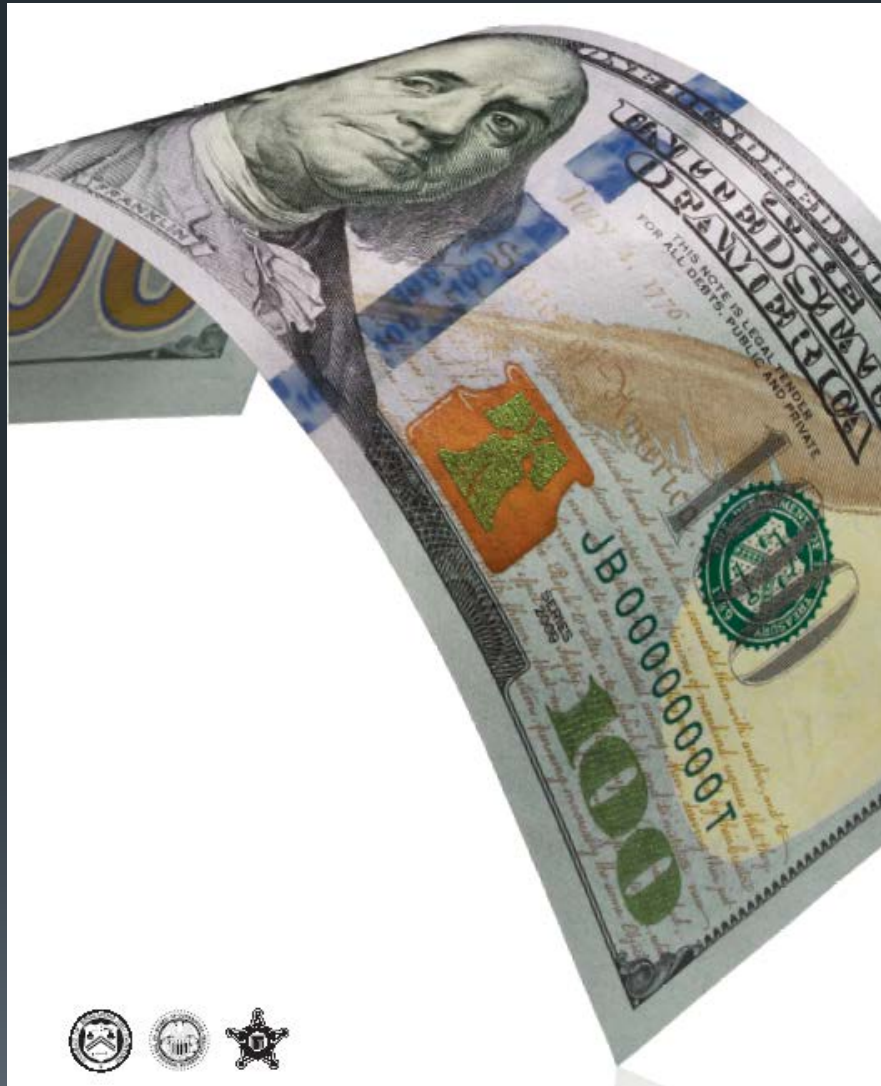
- Convent. fiber
- DSF, NZDSF
- Improved fiber



How many past projections are borne out to be true (or close)?







What are in this course?

- Basic science of optics

Why? We need to know the elementary stuffs first!

- Introduction of optoelectronics/photronics technology

What are needed to “do” optoelectronics/photronics?

Basic classical optics

EM theory of lightwave

Signal & noise

Material science

Fundamental quantum physics

Solid state electronics

Mathematics for physics&engin.

Optomechanical engineering

What are needed?



Operational knowledge (the ability to apply knowledge productively) and not just “familiarity” with topics

A cynic is a person who knows the price of everything and the value of nothing – Bernard Shaw

“Static” or non-operational knowledge is the sense of “knowing things” but can not do research or practical things