Introduction

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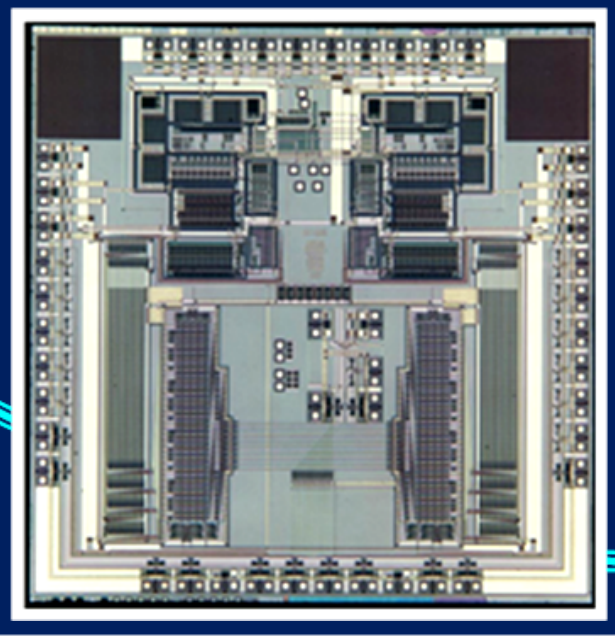
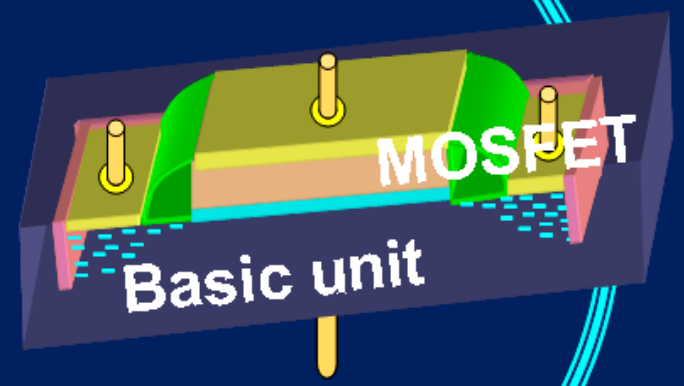
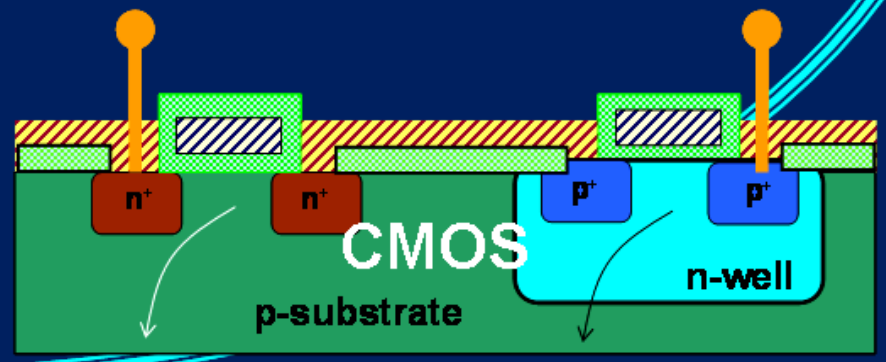
Systems, circuits and devices



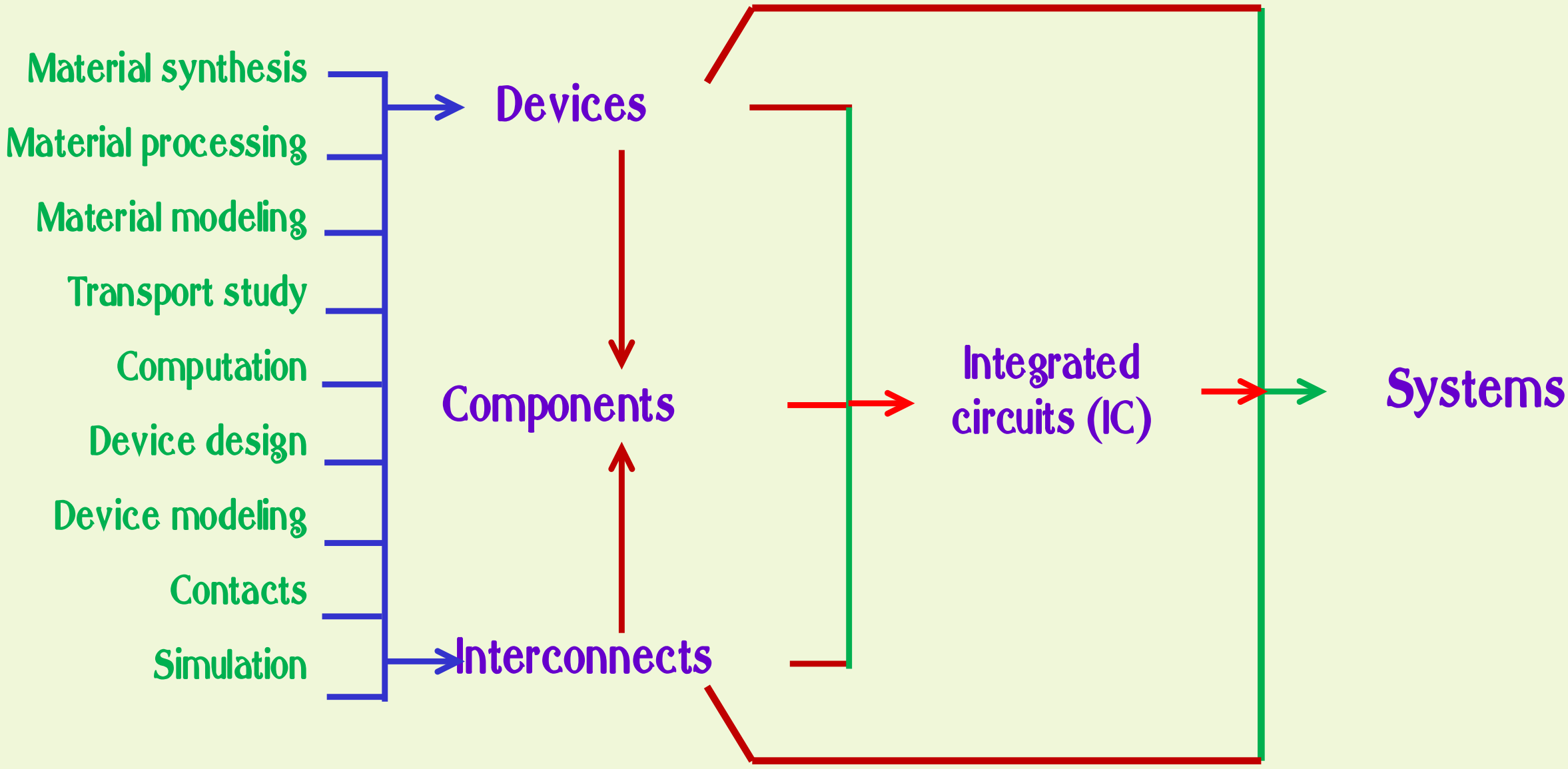
Si, Ge, SiGe,
GaAs, AlGaAs,
InP, ...



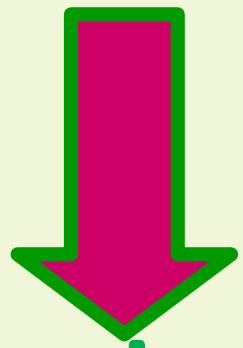


Developing an electronic system

Material	Device/Circuit	Circuit/System



Metal-oxide-semiconductor field effect transistors (MOSFETs)



The workhorse of modern electronic gadgets

Si based CMOS is the key

As a material

Si is abundant in nature

↓

High quality native oxide (SiO_2)

↓

Appropriate mechanical strength

Market

Microelectronic market

↓

80% is dominated by CMOS**

↓

97% is covered by Si

- Complementary-Metal-oxide-Semiconductor (CMOS).
- P - Metal-Oxide-Semiconductor Field Effect Transistor (p-MOSFET).
- N - Metal-Oxide-Semiconductor Field Effect Transistor (n-MOSFET).

$$CMOS = p-MOS + n-MOS$$

- CMOS is a combination of an n-MOSFET and p-MOSFET.