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Smart Photonic and Optoelectronic Integrated Circuits XX

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El-Hang Lee**
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Photonic Integrated Circuit (also known as PIC), is a complex integrated circuit which incorporates a lot of optical devices to form a single photonic circuit. The main difference between a PIC and an Electronic IC is that PIC is analogous to an Electronic Integrated Circuit. Many optical devices like optical amplifiers, multiplexers, de-multiplexers, optical lasers, attenuators and also detectors are integrated on to a Photonic Integrated Circuit. For a large-scale operation of such a device thousands of optical devices will be integrated on to the device. In a PIC, the signals are sent by su The name optoelectronic integrated circuit (OEIC) is used when the components are a combination of photonic and electronic devices. Several review articles have been published on PICs and OIECs.1â€4 This chapter provides an overview of the technology involved and discusses the properties of some important integrated circuits. Keywords. Semiconductor Laser IEEE Photon Heterojunction Bipolar Transistor Bistable Switch Heterodyne Receiver. Photonic integrated circuits utilize photons, massless fundamental particles representing a quantum of light, instead of electrons. Photons move at the speed of light through the transmitting medium with almost no interference from other photons. This greatly increases the bandwidth and speed of the circuit while drastically reducing the amount of energy loss, making PICs more power efficient.