The concept of integrated optics was proposed 30 years ago. The proposal was to integrate optical components such as sources, filters, switches, modulators, and detectors on a chip to form integrated optics circuits. The potential of using integrated optics components in optical communication and signal processing captured the attention of a generation of researchers and motivated the development of new technologies in an attempt to manufacture low-cost optical chips.

A waveguide is the basic component of an integrated optics circuit. The first waveguides were made by sputtering of glass onto glass substrates. In the early 1970s, ion exchange process was used to demonstrate a family of integrated optics devices such as splitters, couplers, filters, and lasers. Later, LiNbO₃ became a material of choice to explore electro-and acousto-optics waveguiding devices. Compound semiconductors attracted attention because they offered production of sources and detectors, and full integration of integrated optical components.

For many years, integrated optics was driven by technology and limited by applications. There was a long wait for applications to catch up. Today, applications are driving the field and its accelerating growth is limited only by the device performance and manufacturing cost. New materials and fabrication processes, such as polymers and sol-gels, are being developed to manufacture low-cost circuits with high functionality.

The papers in this special section report on design and fabrication of new waveguides and integrated optics devices, as well as development of new materials and processes. Several papers discuss gratings, amplifiers and lasers. Development of sol-gel and polymer processes to make passive and active integrated optics devices is the focus of several papers too.

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