

## Overview of Diverse Optical Fiber Types

By Gerd Keiser

**Abstract.** Optical fiber technology has significantly bolstered the growth of photonics applications in numerous areas such as the telecom infrastructure, a wide range of sensors, vehicle and airplane control, life sciences research, and biomedical diagnosis, therapy, monitoring, and surgery. This talk first discusses the fundamental principles for light guiding in conventional solid-core fibers, which gives the necessary background to understand how optical fibers function. Then the talk will describe the operational characteristics of conventional and specialty multimode and single-mode solid-core fibers, double-clad fibers, hard-clad silica fibers, conventional hollow-core fibers, photonic crystal fibers, polymer optical fibers, side-emitting and side-firing fibers, middle-infrared fibers, and optical fiber bundles. Included in this discussion are the fiber materials that are appropriate for use at different wavelengths ranging from 300 nm in the ultraviolet to 10.6 micrometers in the infrared.

**Biography.** Currently Dr. Gerd Keiser is a research professor at Boston University specializing in telecom optical networks and biomedical photonics. Formerly he was a chair professor of electronic engineering at the National Taiwan University of Science and Technology, worked in the telecom industry on optical communication systems and digital switching, and founded PhotonicsComm Solutions, a firm specializing in consulting and education for the telecom and biophotonics communities. In addition, he is an IEEE Life Fellow, an OSA Fellow, a SPIE Fellow, an associate editor of the journal *Optical Fiber Technology*, and the author of four graduate-level books including the widely used text "Optical Fiber Communications."