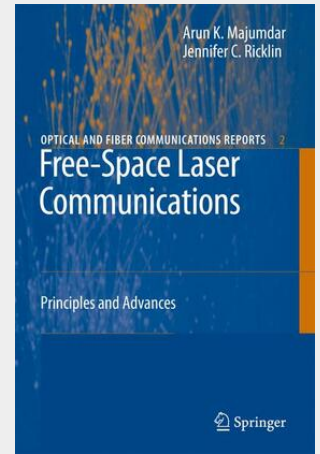


# Free-Space Laser Communications

Principles and Advances

Free-space laser communications, also referred to as optical communications, is a popular subject in today's technological marketplace. A number of conferences on this subject have been organized by professional societies such as SPIE (the International Society of Photo Optical and Instrumentation Engineering), OSA (Optical Society of America), and IEEE (Institute of Electrical and Electronics Engineers). The evolving technology of free-space laser communications is emerging as an appealing alternative to RF communications for links between satellites, as well as a promising addition to terrestrial applications such as video or computer linkups between buildings. There is a pressing need for more information on laser communications that is comprehensive enough to provide in-depth knowledge of free-space communications, and that can satisfy the current demands of the research and commercial needs. This book has been designed to provide a comprehensive, unified tutorial to further understanding of the fundamental techniques for laser communications through the earth's atmosphere. The driving force behind free-space laser communications is the continuous demand for higher bandwidth to deliver high-capacity voice, data, and images to the customer. Free-space propagation distances include ranges that encompass a few millimeters (for example between optical interconnects in a computer using photonics to replace metal interconnects), a few meters (such as indoor communications), a few kilometers (between buildings, campuses, and hospitals), and even up to thousands of kilometers (such as from an aircraft or satellite to the ground).

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