

<<应用光学>>

图书基本信息

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内容概要

This book , Applied Optics , is a fundamental technical course for the specialties of optical engineering , optical measurement , control instruments and electronic science and technology. The book mainly includes basic theories and methods of how to solve problems of geometrical optics , typical optical instruments , optical measurement , color measurement , optical fiber systems , laser systems and infrared optics. The knowledge mentioned above is a must for the opto-electronic students' learning.

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版权页：插图：Chapter I Basic Principles of Geometrical Optics 1.1 Waves and Rays Light is very closely related to the life and well-being of mankind. The growth of plants relies on light, and human vision relies on light as well. The idiom "seeing is believing" reflects people's recognition of the importance of light. People accumulated abundant perceptual knowledge of light through practical experience, and started to study light a long time ago. There are two branches of people's study of light. One is to study the nature of light in order to explain various optical phenomena, which is called physical optics; the other is to study the laws and phenomena of light propagation, which is called geometrical optics. The study of the nature of light started very early but progressed relatively slowly. In 1666, Newton first postulated that light is a kind of elastic corpuscles, which is the corpuscular theory. In 1678, Huygens put forward the wave theory, which says that light is a kind of elastic wave propagating in "ether". In 1873, according to the characteristics of the electromagnetic waves, Maxwell showed that light is in fact an electromagnetic disturbance. In 1905, in order to explain the photoelectric effect, Einstein proposed the hypothesis of "photon", which was later confirmed by the discovery of the Compton's effect. Thereafter people began to have a more correct and complete understanding of the nature of light. In modern physics, light is considered to be a kind of matter with wave-particle duality, namely it has the characteristics of both the waves and the corpuscles. Under certain circumstances, one group of characteristics is more apparent than the other. Except for the cases to study the interaction between light and substances when the corpuscular characteristics of the light must be taken into account, light can generally be considered as a kind of electromagnetic waves, which are called light waves.

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