Colloid Polym Sci (2006) 284: 458
DOI 10.1007/s00396-005-1403-5

BOOK REVIEW

P. Koelsch

# Herbert Gross (Ed.): Handbook of optical systems

## Vol. 1: Fundamentals of technical optics, 826 pages, € 298, ISBN 3-527-40377-9; Vol. 2: Physical image formation, 690 pages, € 298, ISBN 3-527-40378-7; Wiley-VCH, Weinheim, 2005

Published online: 25 October 2005


P. Koelsch (✉)
University of Leipzig, Leipzig, Germany
E-mail: koelsch@physik.uni-leipzig.de

The first two out of six volumes of the series Handbook of optical systems comes with more than 800 full-coloured illustrations and images for an easy understanding of complex optical systems. In the first volume the fundamentals of technical optics are discussed while the second volume elaborates on the introduction given in volume one with more advanced texts on the foundations of image formation.

This series can be used by professionals as a comprehensive reference as well as an introduction for beginners in technical optics. The aim of this series is to provide a combination of a thorough presentation of the current theories combined with practical optical applications. This unique blend is supported by sophisticated illustrations guiding the reader to an intuitive understanding of the concepts. Selected references at the end of each chapter provide useful sources for further reading.

The first volume presents an introduction to geometrical optics. This includes paraxial imaging, ray tracing and the description of optical systems as well as the treatment of material issues, light sources, sensors and photometry. Furthermore, colour theory, special components, gratings and prisms are also treated. There are separate sections devoted to wave optics, abberations and metrology, which will all be considered in detail in the following volumes.

The second volume is devoted to the physical description of optical imaging. Starting from the wave equation, the diffraction theory is developed with special emphasis on aspects related to numerical simulations. After a presentation of the interference and coherence theory, the physical theory of image formation is then developed and, besides classical Fourier optics, extensions for partially coherent illumination and three-dimensional image formation are also discussed. This volume concludes with the presentation of polarization and its effect and consideration in image formation systems.

The complete series of handbooks as listed below will be available in September 2007 (www.wiley-vch.de)

Volume 1: Fundamentals of technical optics

Volume 2: Physical image formation

Volume 3: Abberation theory and correction of optical systems

Volume 4: Survey of optical instruments

Volume 5: Metrology of optical components and systems

Volume 6: Advanced physical optics