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The first two volumes of this handbook series on optical systems covered the basics of geometrical and physical optics. The third volume covered the understanding of aberration theory, performance evaluation, and the fundamental layout of systems. Furthermore, the reader was introduced to the techniques used to improve and optimize optical systems and give them the right interface for manufacture. These topics provide the reader with the main framework for understanding the design and principle of optical systems.

Now in the current fourth volume, we give a summary of the well-known optical system types which have been developed over the last approximately 150 years of system engineering. The content will not consist of a collection or an archive of proved system data, because compilations of this type are available in electronic form today. The goal of this volume is really to demonstrate and explain to the reader the various classes of system and the most important thoughts, principles and properties, which lie behind these successful solutions.

My colleagues have helped me with this task and have therefore made a useful contribution to this volume. Chapter 40 on infrared systems and also parts of Chapter 41 were written by Bertram Achatz. The detailed chapters 37 on eyeglasses and 41 on telescopes are the work of Fritz Diechinger. I would like to acknowledge both colleagues for their involvement, their helpful cooperation and their important contributions. Without their competence and special knowledge, it would be impossible for this volume to have a sufficiently comprehensive content.

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