
Microoptics

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WILEY-VCH Verlag Berlin GmbH
February 7, 2003

Preface

It is a great honour and pleasure to have the opportunity to write the Preface to the book on “Microoptics” by Dr. Stefan Sinzinger and Prof. Jürgen Jahns.

As the authors stated in their book, the concept of microoptics can be thought of in analogy to microelectronics and more widely, microtechnologies. Moreover, readers may discover some different aspects in “Microoptics” after reading this book.

The word “microoptics” was presented by Dr. Teiji Uchida and Dr. Ichiro Kitano in the late 1960’s for forming practical optical components based on gradient index fibers and lenses. By adding some other miniature optical elements, microoptics has been really playing an important role to provide various optical subsystems in the optoelectronics field.

Along with the development of optical fiber communication, the concept of “integrated optics” was proposed by Dr. S. E. Miller in 1969. This concept is based upon planar waveguides which can be prepared by a monolithic fabrication process to deal with lightwaves. Fortunately, we can use now some practical components, such as semiconductor integrated optics based upon semiconductor lasers integrated with modulators and amplifiers, silica-based optical circuits, ultrafast lithium niobate-based modulators, and so on. At that time, I tried to use the new wording “microlens”, but this was not accepted by optical societies. But now, it is registered in the standard keywords.

When I wrote a book in this technical field: “Fundamentals of Microoptics”, published by Academic Press in 1984, I felt that these two concepts were considered separately and should meet some innovative integration consideration to match the development of rapidly growing optoelectronics field such as optical fiber communication, optical disks, optoelectronics equipments, and so on.

Therefore, I think that modern microoptics should involve so-called integrated optics and classical microoptics to provide solutions for responding to the new demand of optoelectronics which we may meet in the 21st century, such as terabit networks and terabyte optical memories, advanced displays, and so on.

This book is beautifully organized and covers important and attractive topics in this field. I found in this book many descriptions which are expected by a lot of readers, i.e., smart pixel including surface emitting lasers, array illuminators, information processing, and so on.

I believe that this book may be read with the highest favour not only by experts in this technical area but also beginners who are going to start research in microoptics.

Congratulations on the publication of “Microoptics”!!

Kenichi Iga

Professor, Tokyo Institute of Technology
Autumn 1998 in Tokyo

Foreword to the Second Edition

The positive response to the First Edition of “Microoptics” has encouraged us to take on the task of revising and extending the book. This was not an easy task for several reasons. First, microoptics is still a “field in flux”. Therefore, making changes in the text is a delicate task if one does not want to destroy the balance between the chapters. Furthermore, one of us (STS) moved to the University of Ilmenau, Germany, just at the time when the revision was due. Delays were thus inevitable.

This Second Edition offers a few changes relative to the First Edition published four years ago. Firstly, of course, we tried to eliminate as many errors as possible. Here, helpful comments of many readers are gratefully acknowledged. Secondly, we supplemented the topic “measurement and characterization of microoptics” which we had omitted in the first edition. We also tried to give more structure to those areas that were “novel” several years ago. Consequently, a few new chapters were added. The aspect of “microoptics in optical design” has recently gained much importance, therefore, a separate chapter devoted to that area was included. Finally, we describe several areas that have come to the foreground in a chapter on “novel directions”.

We are grateful for the good reception the First Edition had among the readership and hope that this Second Edition will continue to be useful for scientists and students. We would like to thank the publishers at Wiley-VCH for their patience and support.

Stefan Sinzinger and Jürgen Jahns

Ilmenau, Hagen
January 2003

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