

Principles and Applications of Nonlinear Optical Materials

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Edited by

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Preface

Nonlinear optics is a topic of much current interest that exhibits a great diversity. Some publications on the subject are clearly physics, while others reveal an engineering bias; some appear to be accessible to the chemist, while others may appeal to biological understanding. Yet all purport to be nonlinear optics so where is the underlying unity? The answer is that the unity lies in the phenomena and the devices that exploit them, while the diversity lies in the materials used to express the phenomena. This book is an attempt to show this unity in diversity by bringing together contributions covering an unusually wide range of materials, preceded by accounts of the main phenomena and important devices.

Because of the diversity, individual materials are treated in separate chapters by different expert authors, while as editors we have shouldered the task of providing the unifying initial chapters. Most main classes of nonlinear optical solids are treated: semiconductors, glasses, ferroelectrics, molecular crystals, polymers, and Langmuir–Blodgett films. (However, liquid crystals are not covered.)

Each class of material is enough for a monograph in itself, and this book is designed to be an introduction suitable for graduate students and those in industry entering the area of nonlinear optics. It is also suitable in parts for final-year undergraduates on project work. It aims to provide a bridge between traditional fields of expertise and the broader field of nonlinear optics. It should also provide information useful to experts in one class of materials who wish to broaden their expertise. For those wanting to know about nonlinear optical materials, this book should suffice, but for those needing further detailed information, suitable references provide access to more specialized work.

We should like to express our gratitude to the publishers, especially for inputs of energy and enthusiasm when we needed them. We are also grateful to our fellow authors for responding positively to our various requests (even the less obviously reasonable ones). Finally we thank all those from whom we have learned about nonlinear optics, hoping that this book will pass on some of what they taught us.

R. W. Munn and C. N. Ironside

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