

Contents

Part I	Electro-optical Effects and Materials	
---------------	--	--

Electro-optical Effects in Dielectric Crystals By P. Günter (With 13 Figures)	2
Electrooptic Effects in Crystals Induced by Phase Transitions By J. Fousek (With 5 Figures)	18
Electric Field Dependence of Optical Properties of Quantum Well Structures. By D.A.B. Miller (With 10 Figures)	35
Transparent Ferroelectric Ceramics I. Composition, Structure and Requirements for Production By A. Krumins and A. Sternberg (With 4 Figures)	50
Transparent Ferroelectric Ceramics II. Specific Properties and Applications. By A. Krumins and A. Sternberg (With 6 Figures) . .	61
Transparent Ferroelectric Ceramics III. Photorefraction and Formation of Holographic Gratings By A. Krumins and A. Sternberg (With 1 Figure)	72

Part II	Electro-optical Effects in Liquid Crystals and Biopolymers	
----------------	---	--

The Chemistry and Physics of Thermotropic Liquid Crystals By E.P. Raynes (With 11 Figures)	80
Electro-optic Effects in Liquid Crystals By E.P. Raynes (With 11 Figures)	90
Electro-optic Devices Using Liquid Crystals By E.P. Raynes (With 11 Figures)	99
Nonlinear Optical and Electro-optical Properties of Biopolymers By S.K. Kurtz, S.D. Kozikowski, and L.J. Wolfram (With 10 Figures)	110

Part III	Electro-optical Devices	
<hr/>		
Introduction to Integrated Optics. By E. Voges (With 28 Figures)		132
Integrated Electro-optic Devices. By E. Voges (With 14 Figures)		150
Integrated Optics for Optical Communications By E. Voges (With 10 Figures)		159
Nuclear Techniques for Optical Waveguide Characterization By A. Carnera (With 11 Figures)		165
Optical Waveguides in LiNbO ₃ Produced by Ti In-diffusion, Ion Exchange and Ion Implantation By A. Carnera (With 17 Figures)		179
Room-Temperature Bulk GaAs: Dominant Nonlinearities, Fast- Recovery Gates, Arrays for Parallel Processing By H.M. Gibbs, N. Peyghambarian, Y.H. Lee, M. Warren, A. Chavez- Pirson, S.H. Park, J. Morhange, A. Jeffrey, S.W. Koch, A.C. Gossard, and W. Wiegmann (With 7 Figures)		195
<hr/>		
Part IV	Photorefractive Effects	
<hr/>		
Introduction to Photorefractive Materials By P. Günter and H.J. Eichler (With 16 Figures)		206
Theory of Volume Hologram Formation in Photorefractive Crystals By L. Solymar (With 5 Figures)		229
Anisotropic Bragg Diffraction in Photorefractive Crystals By E. Voit (With 18 Figures)		246
Physics of the Photorefractive Effect in BaTiO ₃ By M.B. Klein (With 3 Figures)		266
<hr/>		
Part V	Nonlinear Optical Applications with Photorefractive Crystals	
<hr/>		
Introduction to Optical Signal Processing with Photorefractive Materials. By M.P. Petrov		284
Optical Oscillators with Photorefractive Gain By M. Cronin-Golomb, S.-K. Kwong, and A. Yariv (With 11 Figures)		291
Moving Photorefractive Gratings in Bi ₁₂ SiO ₂₀ and Applications to Phase Conjugation and Optical Signal Processing By J.P. Huignard (With 12 Figures)		308

Polarization Properties of Phase Volume Gratings Recorded in a $\text{Bi}_{12}\text{SiO}_{20}$ Crystal for Two Transverse Configurations By A.G. Apostolidis (With 11 Figures)	324
Polarization Properties of Diffraction from Elementary Gratings in Optically Active and Linearly Birefringent Materials By A. Marrakchi (With 13 Figures)	339
Self-induced Changes in the Refractive Index in CdS at $\lambda = 532\text{nm}$ By P.M. Petersen (With 7 Figures)	357
Self-pulsation and Incoherent Beam Coupling Effects in Self-pumped BaTiO_3 By R.W. Eason, A.M.C. Smout, and M.C. Gower (With 8 Figures)	362
Hysteresis in the Bifurcation Structure of a Nonlinear Optical Device with a Time-Dependent Bifurcation Parameter By P.M. Petersen (With 6 Figures)	371
Two-Dimensional Spatial Light Modulators for High-Resolution TV Applications By R. Gerhard-Multhaupt and R. Tepe (With 2 Figures)	377
Photoinduced TE-TM Mode Conversion in Ti:LiNbO_3 Waveguides By C. Walther and P. Günter (With 5 Figures)	381
Index of Contributors	385