

TABLE OF CONTENTS

FOREWORD.....	ix
OPTICAL MASERS—RESEARCH AND DEVELOPMENT	
J. R. Pierce	xvi
PROGRAM	
.....	xix
COMMITTEE.....	xxvii
STIMULATED EMISSION	
H. Kallmann	1
SOME THEORETICAL PROBLEMS IN QUANTUM ELECTRONICS	
N. Bloembergen	13
STATE-OF-THE-ART DEVICES	
T. H. Maiman	25
BASIC CONCEPTS OF OPTICAL COHERENCE THEORY	
E. Wolf.....	29
EQUIVALENCE OF SEMICLASSICAL AND QUANTUM-MECHANICAL DESCRIPTIONS OF STATISTICAL LIGHT BEAMS	
E. C. G. Sudarshan	45
THE HIGH GAIN LASER AS A WAVELENGTH STANDARD	
L. F. Mollenauer, G. F. Imbusch, H. W. Moos, A. L. Schawlow and A. D. May	51
MASERS AND CLASSICAL OSCILLATORS	
P. A. Grivet and A. Blaquiere	69
AMPLITUDE AND FREQUENCY VARIATIONS IN RUBY OPTICAL MASERS	
K. Shimoda	95
CYLINDRICAL MODE OF OSCILLATION IN A RUBY OPTICAL MASER	
T. Yajima, F. Shimizu and K. Shimoda.....	111
SEMICONDUCTOR MASERS	
B. Lax	119

NOISE IN OPTICAL MASER AMPLIFIERS H. A. Haus and J. A. Mullen	131
ON THE THEORY OF OPTICAL RESONATORS G. Toraldo di Francia	157
STATIONARY MODES IN OPTIC AND QUASI-OPTIC CAVITIES H. Schachter and L. Bergstein	173
RING LASER ROTATION RATE SENSOR W. M. Macek, D. T. M. Davis, Jr., R. W. Olthuis, J. R. Schneider and G. R. White	199
THE PUMP-POWER CHART FOR EVALUATION OF MODES IN A LASER OSCILLATOR R. A. Kaplan	211
DETERMINATION OF OPTICAL MASER CAVITY Q E. A. Ballik	231
INTERNAL MODULATION OF OPTICAL MASERS K. Gürs and R. Müller	243
ULTRASONIC CONTROL OF LASER ACTION A. J. DeMaria	253
ZEEMAN TUNING AND INTERNAL MODULATION OF THE $\text{CaF}_2:\text{Dy}^{2+}$ OPTICAL MASER Z. J. Kiss	271
PREDICTION OF Q-SWITCHED LASER ENERGY OUTPUT J. Wenzel	277
HIGH REPETITION RATE PULSED LASERS W. R. Mallory and K. F. Tittel	301
GAIN SATURATION AT 3.39 MICRONS IN THE He-Ne MASER E. I. Gordon, A. D. White and J. D. Rigden	309
INHERENT SPECTRAL PURITY OF OPTICAL MASERS E. A. Ballik	321
SPECTROSCOPY OF TRIVALENT RARE EARTH IONS G. H. Dieke and B. Pandey	327
LASER ACTION IN A SOLUTION OF A EUROPIUM CHELATE A. Lempicki and H. Samelson	347

SURVEY OF THE SPECTRA OF THE DIVALENT RARE EARTH IONS IN CUBIC CRYSTALS D. S. McClure and Z. J. Kiss	357
THE ULTRAVIOLET ABSORPTION SPECTRA OF RUBY C. S. Naiman and A. Linz.....	369
BLUE FLUORESCENCE IN CRYSTALS EXCITED BY THE RUBY OPTICAL MASER S. Singh and B. P. Stoicheff.....	385
ON THE TIME-RESOLVED HIGH-RESOLUTION SPECTROSCOPIC STUDY OF THE EMISSION FROM THE RUBY LASER M. Shimazu, I. Ogura, A. Hashimoto, and H. Sasaki.....	405
COHERENT GENERATION OF LIGHT IN GAS-PHASE CHEMICAL REACTIONS M. Hertzberg	417
THE USE OF RESONANT CAVITY SPECTROSCOPY IN STUDYING POPULATIONS IN THE He-Ne SYSTEM C. B. Zarowin, M. Schiff and G. R. White	425
Nd ³⁺ FLUORESCENCE AND STIMULATED EMISSION IN OXIDE GLASSES R. D. Maurer	435
EFFECT OF GROWTH PARAMETERS ON THE THRESHOLD OF CaWO ₄ :Nd CRYSTALS K. Nassau	451
PROPERTIES AND MECHANISMS OF GaAs INJECTION LASERS W. P. Dumke	461
ANGULAR DISTRIBUTION OF INFRARED RADIATION FROM LASING GaAs DIODES A. E. Michel and E. J. Walker	471
SPECTRAL CHARACTERISTICS OF CONTINUOUSLY OPERATING GaAs LASERS P. P. Sorokin, J. D. Axe, Jr., and J. R. Lankard	481
OPTICAL MASER ACTION OF ORGANIC SPECIES IN AMORPHOUS MEDIA D. J. Morantz	491
BIOLOGICAL EFFECTS OF CONCENTRATED LASER BEAMS V. T. Tomberg	505

OPTICAL HETERODYNING AND OPTICAL DEMODULATION AT MICROWAVE FREQUENCIES A. E. Siegman, S. E. Harris and B. J. McMurtry	511
OPTICAL MIXING OF COHERENT AND INCOHERENT LIGHT A. W. Smith and N. Braslau	529
DETECTION OF TRANSVERSE MODE BEAT FREQUENCIES FROM RUBY LASERS C. M. Stickley and R. L. Townsend, Jr.....	541
PHOTODIODE DETECTION L. K. Anderson.....	549
DETECTION AND AMPLIFICATION OF THE MICROWAVE SIGNAL IN LASER LIGHT BY A PARAMETRIC DIODE S. Saito, K. Kurokawa, Y. Fujii, T. Kimura.....	567
AMPLIFICATION BY RESONANCE SATURATION IN MILLIMETER WAVE CAVITIES B. Senitzky and S. Cutler	579
PROPOSALS FOR MILLIMETRIC PHOTO-MIXING USING SURFACE WAVES A. L. Cullen and J. A. Jones	585
LASER POWER AND ENERGY MEASUREMENT USING NONLINEAR POLARIZATION IN CRYSTALS A. K. Kamal and M. Subramanian.....	601
THE AMMONIA MASER OSCILLATOR AS A DETECTOR OF STIMULATED EMISSION IN THE FAR INFRARED D. C. Laine, R. C. Srivastava, A. L. S. Smith and D. J. E. Ingram.....	617
MICROWAVE MASER ACTION IN RUBY AT 78°K BY LASER PUMPING A. Szabo	627
PIEZOELECTRIC LASER MODULATOR B. O. Seraphin, D. G. McCauley, and L. G. LaMarca.....	635
MODULATION OF LASER OUTPUT BY MULTIPLE-REFLECTION KERR EFFECT ON THIN MAGNETIC FILMS D. Chen	641
INDEX TO CONTRIBUTORS.....	649