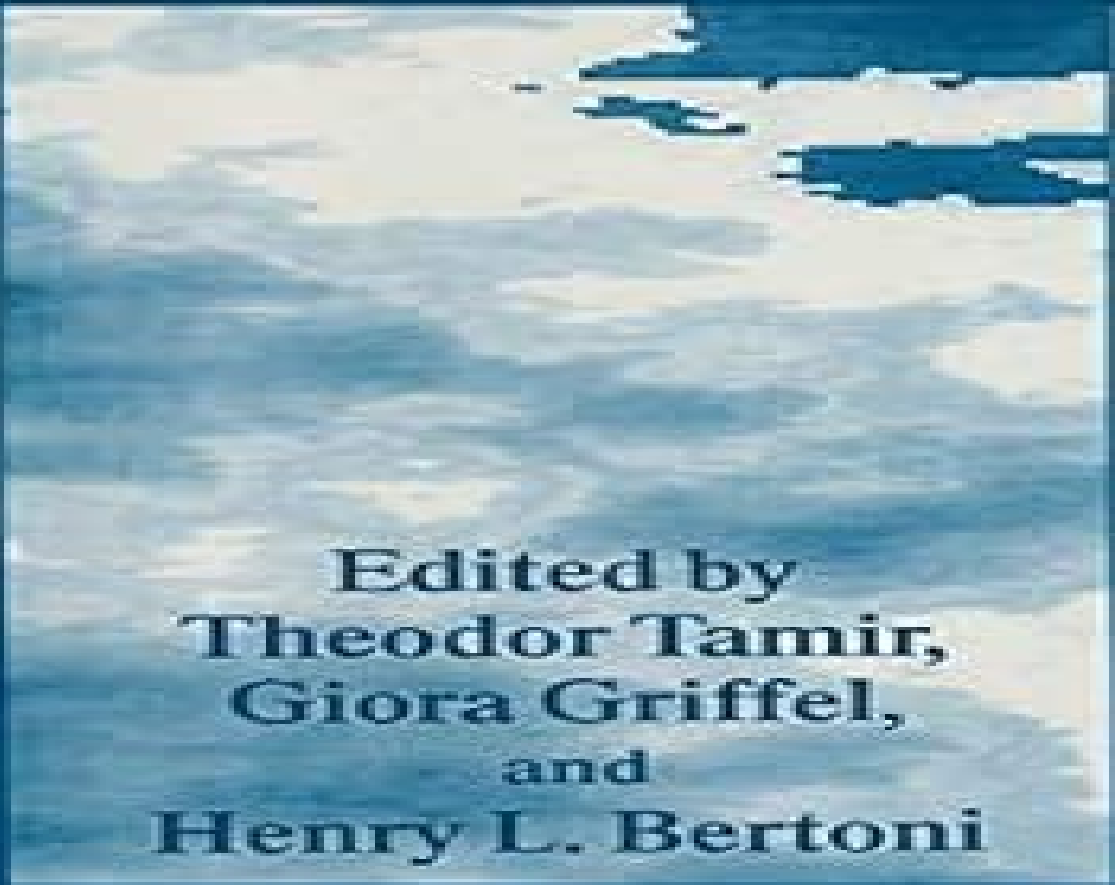


# ***GUIDED-WAVE OPTOELECTRONICS***

*Device Characterization,  
Analysis, and Design*



Edited by  
Theodor Tamir,  
Giora Griffel,  
and  
Henry L. Bertoni

# Guided Wave Optoelectronics Device Characterization Analysis And Design

**Charles Blain**



## **Guided Wave Optoelectronics Device Characterization Analysis And Design:**

**Guided-Wave Optoelectronics** Theodor Tamir, 2013-03-08 The first guided wave components that employed signals in the form of light beams traveling along thin films were fabricated a little more than two decades ago The parallel development of semiconductor lasers and the subsequent availability of low loss optical fibers made possible the implementation of completely optical systems for communications signal processing and other applications that had used only electronic circuitry in the past Referred to as integrated optics this technology has been reinforced by utilizing electronic components that act as controlling elements or perform other functions for which the optical counterparts are not as effective The broader area thus generated was aptly named optoelectronics and it currently represents a fascinating rapidly evolving and most promising technology Specifically the amalgamation of electronic and optics components into an integrated optoelectronics format is expected to provide a wide range of systems having miniaturized high speed broad band and reliable components for telecommunications data processing optical computing and other applications in the near and far future This book is intended to cover primarily the optical portion of the optoelectronics area by focusing on the theory and applications of components that use guided optical waves Hence all aspects of integrated optics are discussed but optoelectronic components having primarily electronic rather than optical functions have not been included Each chapter has been written by experts who have actively participated in developing the specific areas addressed by them

**Guided-Wave Optoelectronics** Theodor Tamir, Giora Griffel, Henry L. Bertoni, 2013-06-09 In 1945 Dr Ernst Weber founded and was the first Director of the Microwave Research Institute MRI at Polytechnic University at that time named the Polytechnic Institute of Brooklyn MRI gained worldwide recognition in the 50s and 60s for its research in electromagnetic theory antennas and radiation network theory and microwave networks microwave components and devices It was also known through its series of 24 topical symposia and the widely distributed hardbound MRI Symposium Proceedings Rededicated as the Weber Research Institute WRI in 1986 the institute currently conducts research in such areas as electromagnetic propagation and antennas ultrabroadband electromagnetics pulse power acoustics gaseous electronics plasma physics solid state materials quantum electronics electromagnetic launchers and networks Following MRI tradition WRI has launched its own series of in depth topical conferences with published proceedings Previous conferences in this series were Directions in Electromagnetic Wave Modeling October 1990 Ultra Wideband Short Pulse Electromagnetics October 1992 Ultra Wideband Short Pulse Electromagnetics II October 1994 The proceedings of these conferences were also published by Plenum Press This volume constitutes the proceedings of the fourth WRI International Conference dealing with Guided Wave Optoelectronics Device Characterization Analysis and Design The conference was held October 26-28 1994 at the Polytechnic University in Brooklyn New York in cooperation with the IEEE Lasers and Electro Optics Society and with the Optical Society of America Theodor Tamir Giora Griffel Henry L Bertoni v CONTENTS INTRODUCTORY Scanning the

symposium 1 T Tamir and G Griffel Photonics in telecommunications 3 H *Guided-Wave Optoelectronics: Device Characterization, Analysis, and Design. International Symposium Proceedings Held in Brooklyn, NY on October 26-28, 1994*, 1995 *International WRI Symposium on Guided-Wave Optoelectronics: Device Characterization, Analysis and Design (4th), Held in Brooklyn, New York on 26-28 October, 1994*, 1994 **International WRI Symposium on Guided-Wave Optoelectronics: Device Characterization, Analysis and Design**, 1995 The International symposium on Guided Wave Optoelectronics held October 26 28 1994 was the fourth in the conference series sponsored by the Weber Research Institute of Polytechnic University Following the successful format of preceding conferences the Symposium strived to achieve a critical in depth coverage of fundamental issues in a rapidly evolving area Its aim was to examine guided wave phenomena and related aspects of optoelectronics and to review state of the art techniques for solving electromagnetic problems that arise in that field The Symposium specifically addressed characterization and modeling methods that are most relevant to the analysis and design of optoelectronic devices The focus was on composite devices employing guided wave components that connect multiple optical and or electronic elements in hybrid integrated or other forms Basic theory analytical and numerical methods were stressed rather than fabrication and experimental techniques Guided-Wave Optoelectronics Theodor Tamir, Giora Griffel, Henry L. Bertoni, 2013-06-29 In 1945 Dr Ernst Weber founded and was the first Director of the Microwave Research Institute MRI at Polytechnic University at that time named the Polytechnic Institute of Brooklyn MRI gained worldwide recognition in the 50s and 60s for its research in electromagnetic theory antennas and radiation network theory and microwave networks microwave components and devices It was also known through its series of 24 topical symposia and the widely distributed hardbound MRI Symposium Proceedings Rededicated as the Weber Research Institute WRI in 1986 the institute currently conducts research in such areas as electromagnetic propagation and antennas ultrabroadband electromagnetics pulse power acoustics gaseous electronics plasma physics solid state materials quantum electronics electromagnetic launchers and networks Following MRI tradition WRI has launched its own series of in depth topical conferences with published proceedings Previous conferences in this series were Directions in Electromagnetic Wave Modeling October 1990 Ultra Wideband Short Pulse Electromagnetics October 1992 Ultra Wideband Short Pulse Electromagnetics II October 1994 The proceedings of these conferences were also published by Plenum Press This volume constitutes the proceedings of the fourth WRI International Conference dealing with Guided Wave Optoelectronics Device Characterization Analysis and Design The conference was held October 26 28 1994 at the Polytechnic University in Brooklyn New York in cooperation with the IEEE Lasers and Electro Optics Society and with the Optical Society of America Theodor Tamir Giora Griffel Henry L Bertoni v CONTENTS INTRODUCTORY Scanning the symposium 1 T Tamir and G Griffel Photonics in telecommunications 3 H The Handbook of Photonics Mool C. Gupta, John Ballato, 2018-10-03 Reflecting changes in the field in the ten years since the publication of the first edition The Handbook of Photonics Second Edition

explores recent advances that have affected this technology In this new updated second edition editor Mool Gupta is joined by John Ballato strengthening the handbook with their combined knowledge and the continued contributions of world class researchers New in the Second Edition Information on optical fiber technology and the economic impact of photonics Coverage of emerging technologies in nanotechnology Sections on optical amplifiers and polymeric optical materials The book covers photonics materials devices and systems respectively An introductory chapter new to this edition provides an overview of photonics technology innovation and economic development Resting firmly on the foundation set by the first edition this new edition continues to serve as a source for introductory material and a collection of published data for research and training in this field making it the reference of first resort

**Lasers** Charles Blain, 2002 Developments in lasers continue to enable progress in many areas such as eye surgery the recording industry and dozens of others This book presents citations from the book literature for the last 25 years and groups them for ease of access which is also provided by subject author and titles indexes

*Resonant Tunneling Diode Photonics* Charlie Ironside, Bruno Romeira, José Figueiredo, 2019-11-11 This book brings together two broad themes that have generated a great deal of interest and excitement in the scientific and technical community in the last 100 years or so quantum tunnelling and nonlinear dynamical systems It applies these themes to nanostructured solid state heterostructures operating at room temperature to gain insight into novel photonic devices systems and applications

**Phased Array Antennas** Robert C. Hansen, 2009-11-19 An in depth treatment of array phenomena and all aspects of phased array analysis and design Phased Array Antennas Second Edition is a comprehensive reference on the vastly evolving field of array antennas The Second Edition continues to provide an in depth evaluation of array phenomena with a new emphasis on developments that have occurred in the field over the past decade The book offers the same detailed coverage of all practical and theoretical aspects of phased arrays as the first edition but it now includes New chapters on array fed reflector antennas connected arrays and reflect arrays and retrodirective arrays Brand new coverage of artificial magnetic conductors and Bode matching limitations A clear explanation of the common misunderstanding of scan element pattern measurement along with appropriate equations In depth coverage of finite array Gibbsian models photonic feeding and time delay waveguide simulators and beam orthogonality The book is complemented with a multitude of original curves and tables that illustrate how particular behaviors were derived from the author s hundreds of programs developed over the past forty years Additionally numerous computer design algorithms and numerical tips are included throughout the book to help aid in readers comprehension Phased Array Antennas Second Edition is an ideal resource for antenna design engineers radar engineers PCS engineers and communications engineers or any professional who works to develop radar and telecommunications systems It also serves as a valuable textbook for courses in phased array design and theory at the upper undergraduate and graduate levels

**Nonlinear Optics** Natalia Kamanina, 2012-02-29 Rapid development of optoelectronic devices and laser techniques poses an important task of creating

and studying from one side the structures capable of effectively converting modulating and recording optical data in a wide range of radiation energy densities and frequencies from another side the new schemes and approaches capable to activate and simulate the modern features It is well known that nonlinear optical phenomena and nonlinear optical materials have the promising place to resolve these complicated technical tasks The advanced idea approach and information described in this book will be fruitful for the readers to find a sustainable solution in a fundamental study and in the industry approach The book can be useful for the students post graduate students engineers researchers and technical officers of optoelectronic universities and companies     Optics and Lasers Matt Young,2000-09-06 Optics and Lasers is an introduction to engineering and applied optics including not only elementary ray and wave optics but also lasers holography coherence fibers and optical waveguides It stresses physical principles applications and instrumentation It will be most useful to the practicing engineer or experimental scientist graduate student or advanced undergraduate It contains more than enough material from which to select the core of an introductory optics course and sufficient to form the bulk of a more advanced course

Semiconductor Integrated Optics for Switching Light Charlie Ironside,2017-09-12 This book covers the technology of switching or modulating light in semiconductor optical waveguides Currently a key function for optical communications systems is the conversion of data from an electrical signal to an optical signal for transmission in very low loss optical fibres and the converse process of optical to electrical conversion the O E O data conversion This conversion between electronic and photonic signals imposes an energy consumption overhead on optical communication systems So many research workers have been attracted to ultrafast all optical switching of data in different formats As a way of introduction to all optical switching in semiconductor waveguides the book covers the electro optic effect electroabsorption and electrorefraction effects that can be used in semiconductor optical modulation devices But the book focuses on all optical switching using second and third order optical nonlinearities in AlGaAs optical waveguides It covers a variety of device configurations including integrated nonlinear couplers and Mach Zehnder interferometers Further it provides design software in suit of Mathematica notebooks that can be used to explore the device design     **NASA Technical Memorandum** ,1963

Illustrated Official Journal (patents) Great Britain. Patent Office,1996     *American Book Publishing Record* ,1995

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