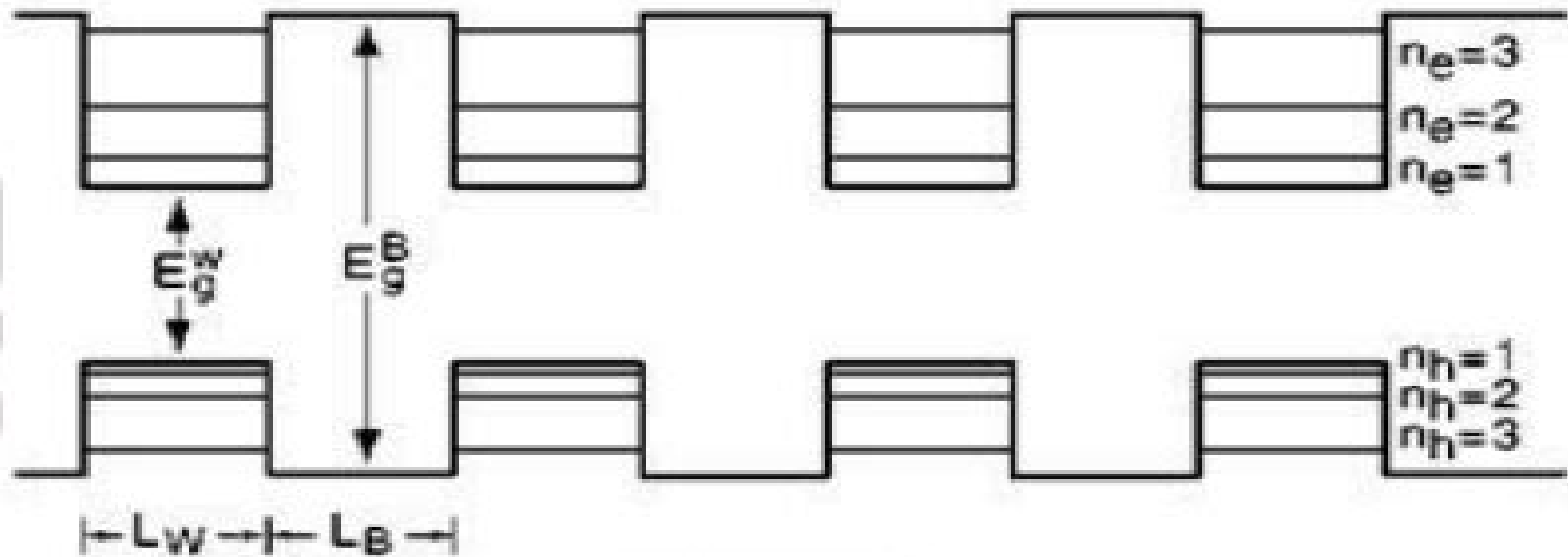
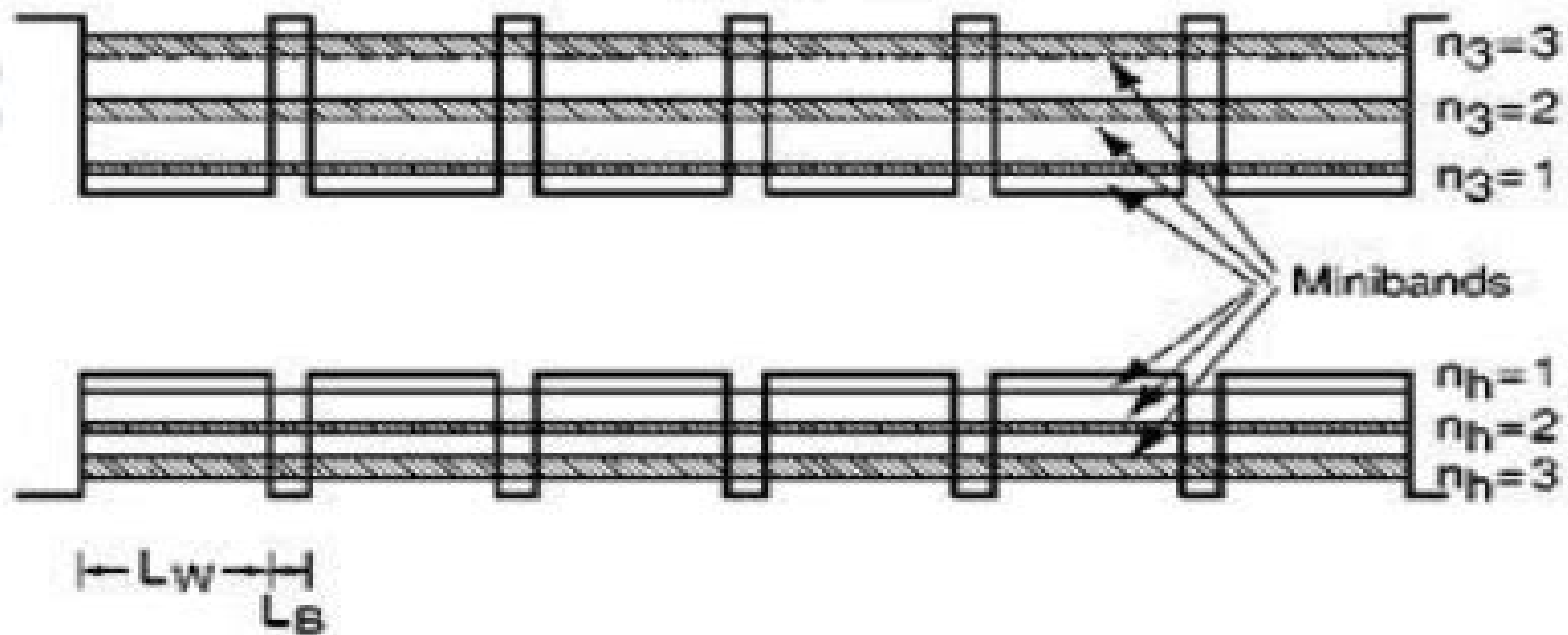


## Multiple Quantum Wells



## Superlattice



# Long Wavelength Infrared Emitters Based On Quantum Wells And Superlattices

**Stephen J. Pearton**



## **Long Wavelength Infrared Emitters Based On Quantum Wells And Superlattices:**

**Long Wavelength Infrared Emitters Based on Quantum Wells and Superlattices** Manfred Helm, 2000-10-31 This book offers a thorough survey of long wavelength infrared semiconductor emitters based primarily on quantum wells and superlattices Featuring contributions from the most prominent researchers in the field this volume allows readers to compare different types of lasers as well as examine investigations of potential far infrared terahertz sources This is an essential reference for researchers engineers and graduate students who wish to obtain comprehensive knowledge about infrared semiconductor sources and recent developments in this field *Semiconductor Quantum Well Intermixing* J. T.

Lie, 2000-01-18 *Semiconductor Quantum Well Intermixing* is an international collection of research results dealing with several aspects of the diffused quantum well DFQW ranging from Physics to materials and device applications The material covered is the basic interdiffusion mechanisms of both cation and anion groups as well as the properties of band structure

**Mid-infrared Semiconductor Optoelectronics** Anthony Krier, 2007-05-22 Optoelectronic devices operating in the mid infrared wavelength range offer applications in a variety of areas from environmental gas monitoring around oil rigs to the detection of narcotics They could also be used for free space optical communications thermal imaging applications and the development of homeland security measures Mid infrared Semiconductor Optoelectronics is an overview of the current status and technological development in this rapidly emerging area the basic physics some of the problems facing the design engineer and a comparison of possible solutions are laid out the different lasers used as sources for mid infrared technology are considered recent work in detectors is reviewed the last part of the book is concerned with applications With a world wide authorship of experts working in many mid infrared related fields this book will be an invaluable reference for researchers and graduate students drawn from physics electronic and electrical engineering and materials science

**Strained-Layer Quantum Wells and Their Applications** M. O. Manasreh, 1997-12-23 Semiconductor devices based on lattice mismatched heterostructures have been the subject of much study This volume focuses on the physics technology and applications of strained layer quantum wells and superlattices featuring chapters on aspects ranging from theoretical modeling of quantum well lasers to materials characterization and assessment by the most prominent researchers in the field It is an essential reference for both researchers and students of semiconductor lasers sensors and communications

*Photonic Crystals* Alessandro Massaro, 2012-03-30 The second volume of the book concerns the characterization approach of photonic crystals photonic crystal lasers photonic crystal waveguides and plasmonics including the introduction of innovative systems and materials Photonic crystal materials promises to enable all optical computer circuits and could also be used to make ultra low power light sources Researchers have studied lasers from microscopic cavities in photonic crystals that act as reflectors to intensify the collisions between photons and atoms that lead to lasing but these lasers have been optically pumped meaning they are driven by other lasers Moreover the physical principles behind the phenomenon of slow

light in photonic crystal waveguides as well as their practical limitations are discussed This includes the nature of slow light propagation its bandwidth limitation coupling of modes and particular kind terminating photonic crystals with metal surfaces allowing to propagate in surface plasmon polariton waves The goal of the second volume is to provide an overview about the listed issues     Vertical-Cavity Surface-Emitting Lasers Julian Cheng, Niloy K. Dutta, 2000-07-06 Since first coming into existence in the early 90s the vertical cavity surface emitting laser VCSEL has made several quantum leaps in performance The performance of VCSELs now exceeds that of edge emitting lasers in many respects and offers a superior optical beam and much easier monolithic integrability As the VCSEL technology improves further and their number and variety multiply their potential applications will likely expand at a rapid pace Vertical cavity Surface Emitting Lasers Technology and Applications addresses two main objectives It provides the researcher and device engineer with a reference guide to understanding the physical principles as well as the practical design concepts of VCSELs Furthermore it provides the system designer or application engineer with a review of the properties of VCSELs and an overview of some of the applications in which the VCSEL has already played an important role This book features contributions from prominent researchers in the field     InP and Related Compounds M O Manasreh, 2000-08-08 InP is a key semiconductor for the production of optoelectronic and photonic devices Its related compounds such as InGaAsP alloy have been realized as very important materials for communication in the 1.3 and 1.55 micron spectral regions Furthermore the applications on InP and related compounds have extended to other areas that include laser diodes light emitting diodes photodetectors waveguides photocathodes solar cells and many other applications The topics presented in this book have been chosen to achieve a balance between the properties of bulk materials doping characterization applications and devices This unique volume featuring chapters written by experts in the field provides a good starting point for those who are new to the subject and contains detailed results and in depth discussions for those who are experts in the field     Defects in Optoelectronic Materials Kazumi Wada, 2022-09-16 Defects in Optoelectronic Materials bridges the gap between device process engineers and defect physicists by describing current problems in device processing and current understanding of these defects based on defect physics The volume covers defects and their behaviors in epitaxial growth in various processes such as plasma processing deposition and implantation and in device degradation This book also provides graduate students cutting edge information on devices and materials interaction     Structural and Optical Properties of Porous Silicon Nanostructures G Amato, C. Delerue, H J VonBardeleben, 1998-02-25 This volume provides a comprehensive review of the experimental and theoretical aspects of the optical and transport properties of nanoporous silicon their relation to the microscopic structure of nanocrystals and the application of porous silicon in optical devices As porous silicon is an ideal substance for the modelling of optical processes in nanocrystalline materials this volume also is an excellent reference source on the more general subject of the structural and optical properties of nanocrystalline semiconductors     **GaN and Related Materials** Stephen

J. Pearton, 1997-10-29 Presents views on current developments in heat and mass transfer research related to the modern development of heat exchangers Devotes special attention to the different modes of heat and mass transfer mechanisms in relation to the new development of heat exchangers design Dedicates particular attention to the future needs and demands for further development in heat and mass transfer GaN and related materials are attracting tremendous interest for their applications to high density optical data storage blue green diode lasers and LEDs high temperature electronics for high power microwave applications electronics for aerospace and automobiles and stable passivation films for semiconductors In addition there is great scientific interest in the nitrides because they appear to form the first semiconductor system in which extended defects do not severely affect the optical properties of devices This series provides a forum for the latest research in this rapidly changing field offering readers a basic understanding of new developments in recent research Series volumes feature a balance between original theoretical and experimental research in basic physics device physics novel materials and quantum structures processing and systems     *Antimonide-Related Strained-Layer Heterostructures* M. O. Manasreh, 2019-08-16 Interest in antimonide related heterostructures is burgeoning due to their applications as light sources diode lasers modulators filters switches nonlinear optics and field effect transistors This volume featuring contributions from leading researchers in the field is the first book to focus on antimonide related topics It offers to both the beginning student and the advanced researcher a comprehensive review of the state of the art in this exciting new area of research     **Silicon Carbide** Chuan Feng Zhe, 2003-10-30 This book will provide useful information to material growers and evaluators device design and processing engineers as well as potential users of SiC technologies This book will help identify remaining challenging issues to stimulate further investigation to realize the full potential of wide band gap SiC for optoelectronic and microelectronic applications     **Lead Chalcogenides** D. Khokhlov, 2002-11-15 Lead Chalcogenides remain one of the basic materials of modern infrared optoelectronics This volume presents the properties of lead chalcogenides including the basic physical features the bulk and epitaxial growth technique and the 2 D physics of lead chalcogenide based structures In addition the theoretical approaches for band structure and impurity state calculations are reviewed     *Microprobe Characterization of Optoelectronic Materials* Juan Jimenez, 2024-11-01 Each chapter in this book is written by a group of leading experts in one particular type of microprobe technique They emphasize the ability of that technique to provide information about small structures i e quantum dots quantum lines microscopic defects strain layer composition and its usefulness as diagnostic technique for device degradation Different types of probes are considered electrons photons and tips and different microscopies optical electron microscopy and tunneling It is an ideal reference for post graduate and experienced researchers as well as for crystal growers and optoelectronic device makers     *II-VI Semiconductor Materials and their Applications* MariaC. Tamargo, 2018-05-04 II VI Semiconductor Materials and Their Applications deals with II VI compound semiconductors and the status of the two areas of current optoelectronics applications blue green emitters and IR

detectors Specifically the growth characterization materials and device issues for these two applications are described Emphasis is placed on the wide bandgap emitters where much progress has occurred recently The book also presents new directions that have potential future applications in optoelectronics for II-VI materials In particular it discusses the status of dilute magnetic semiconductors for magnetic optical and electromagnetic devices nonlinear optical properties photorefractive effects and new materials and physics phenomena such as self-organized low-dimensional structures

**II-VI Semiconductor Materials and Their Applications** is a valuable reference book for researchers in the field as well as a textbook for materials science and applied physics courses

**III-V Nitride Semiconductors** Edward T. Yu, 2002-10-30 The concepts in this book will provide a comprehensive overview of the current state for a broad range of nitride semiconductor devices as well as a detailed introduction to selected materials and processing issues of general relevance for these applications This compilation is very timely given the level of interest and the current stage of research in nitride semiconductor materials and device applications This volume consists of chapters written by a number of leading researchers in nitride materials and device technology addressing Ohmic and Schottky contacts AlGaInN multiple quantum well laser diodes nitride vertical cavity emitting lasers and ultraviolet photodetectors This unique volume provides a comprehensive review and introduction to application and devices based on GaN and related compounds for newcomers to the field and stimulus to further advances for experienced researchers

**III-Nitride Semiconductors** Hongxing Jiang, 2002-06-28 The first part of a comprehensive overview of fundamental optical properties of III-nitride semiconductors All optoelectronic applications based on III-nitrides are due to their unique optical properties and characterizations of III-nitrides Much information which is critical to the design and improvement of optoelectronic devices based on III-nitrides has been obtained in the last several years This is the first of a two-part Volume in the series Optoelectronic Properties of Semiconductors and Superlattices Part I begins with time-resolved studies of semiconductors and moves on to the emphasis on time-resolved photoluminescence of nitride materials and device technology and focuses on Raman studies and properties of III-Nitrides This unique volume provides a comprehensive review and introduction of the defects and structural properties of GaN and related compounds This would be excellent for newcomers to the field and is a stimulus to further advances for experienced researchers

**III-Nitride Semiconductors Optical Properties** Part I combines contributions from active experts in the field with diverse backgrounds This book provides a very important step in advancing the state of research and device development in the field of III-nitride materials

**Silicon-Germanium Carbon Alloys** S. Pantellides, 2002-07-26 Carbon C and Silicon Germanium SiGe work like a magic sauce At least in small concentrations they make everything taste better It is remarkable enough that SiGe a new material and the heterobipolar transistor a new device appear on the brink of impacting the exploding wireless market The addition of C to SiGe albeit in small concentrations looks to have breakthrough potential Here at last is proof that materials science can put a rocket booster on the silicon mind the silicon transistor Scientific excitement arises as always from the new

possibilities a multicomponent materials system offers Bandgaps can be changed strains can be tuned and properties can be tailored This is catnip to the materials scientist The wide array of techniques applied here to the SiGeC system bear testimony to the ingenious approaches now available for mastering the complexities of new materials

**GaN and Related Materials II** Stephen J. Pearton, 2000-10-31 The first GaN and Related Materials covered topics such as a historical survey of past research optical electrical and microstructural characterization theory of defects bulk crystal growth and performance of electronic and photonic devices This new volume updates old research where warranted and explores new areas such as UV detectors microw

Device Physics of Narrow Gap Semiconductors Junhao Chu, Arden Sher, 2009-10-13 Narrow gap semiconductors obey the general rules of semiconductor science but often exhibit extreme features of these rules because of the same properties that produce their narrow gaps Consequently these materials provide sensitive tests of theory and the opportunity for the design of innovative devices Narrow gap semiconductors are the most important materials for the preparation of advanced modern infrared systems Device Physics of Narrow Gap Semiconductors a forthcoming second book offers descriptions of the materials science and device physics of these unique materials Topics covered include impurities and defects recombination mechanisms surface and interface properties and the properties of low dimensional systems for infrared applications This book will help readers to understand not only semiconductor physics and materials science but also how they relate to advanced opto electronic devices The final chapter describes the device physics of photoconductive detectors photovoltaic infrared detectors super lattices and quantum wells infrared lasers and single photon infrared detectors

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which was held at the unisa muckleneck campus in pretoria on friday his grace bishop dr engenas joseph lekganyane was installed as the spiritual leader and bishop of the st engenas zion christian church at a church

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web 21 january 1931 date of death 11 november 1972 joseph lekganyane was born in 21 january 1931 in moria his father is the founder of the zion christian church zcc in 1910 he attended school up to standard six and later a junior certificate standard nine

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