Optically Pumped Semiconductor Disk Lasers For High Power

The expanded fourth edition of the book that offers an essential introduction to laser technology and the newest developments in the field. The revised and updated fourth edition of Understanding Lasers offers an essential guide and introduction that explores how lasers work, what they do, and how they are applied in the real world. The author—a Fellow of The Optical Society—reviews the key concepts of physics and optics that are essential for understanding lasers and explains how lasers operate. The book also contains information on the optical accessories used with lasers. Written in non-technical terms, the book gives an overview of the wide-variety laser types and configurations. Understanding Lasers covers fiber, solid-state, excimer, helium-neon, carbon dioxide, free-electron lasers, and more. In addition, the book also explains concepts such as the difference between laser oscillation and amplification, the importance of laser gain, and tunable lasers. The updated fourth edition highlights the most recent research and development in the field. This important resource: Includes a new chapter on fiber lasers and amplifiers Reviews new
topics on physics of optical fibers and fiber lasers, disk lasers, and Ytterbium lasers. Contains new sections on Laser Geometry and Implications, Diode Laser Structures, Optimal Parametric Sources, and 3D Printing and Additive Manufacturing. Puts the focus on research and emerging developments in areas such as spectroscopy, slow light, laser cooling, and extremely precise measurements. Contains appendices, glossary, and index that help make this book a useful reference.

Written for engineering and physics students, engineers, scientists, and technicians, the fourth edition of Understanding Lasers contains the basic concepts of lasers and the most recent advances in the technology.

METAL ADDITIVE MANUFACTURING: A comprehensive review of additive manufacturing processes for metallic structures. Additive Manufacturing (AM)—also commonly referred to as 3D printing—builds three-dimensional objects by adding materials layer by layer. Recent years have seen unprecedented investment in additive manufacturing research and development by governments and corporations worldwide. This technology has the potential to replace many conventional manufacturing processes, enable the development of new industry practices, and transform the entire manufacturing enterprise. Metal Additive Manufacturing provides an up-to-date review of all essential physics of metal additive manufacturing techniques with emphasis on both laser-based and non-
laser-based additive manufacturing processes. This comprehensive volume covers fundamental processes and equipment, governing physics and modelling, design and topology optimization, and more. The text addresses introductory, intermediate, and advanced topics ranging from basic additive manufacturing process classification to practical and material design aspects of additive manufacturability. Written by a panel of expert authors in the field, this authoritative resource: Provides a thorough analysis of AM processes and their theoretical foundations Explains the classification, advantages, and applications of AM processes Describes the equipment required for different AM processes for metallic structures, including laser technologies, positioning devices, feeder and spreader mechanisms, and CAD software Discusses the opportunities, challenges, and current and emerging trends within the field Covers practical considerations, including design for AM, safety, quality assurance, automation, and real-time control of AM processes Includes illustrative cases studies and numerous figures and tables Featuring material drawn from the lead author’s research and professional experience on laser additive manufacturing, Metal Additive Manufacturing is an important source for manufacturing professionals, research and development engineers in the additive industry, and students and researchers involved in mechanical, mechatronics, automatic control, and
materials engineering and science. Written by a team of European experts in the field, this book addresses the physics, the principles, the engineering methods, and the latest developments of efficient and compact ultrafast lasers based on novel quantum-dot structures and devices, as well as their applications in biophotonics. Recommended reading for physicists, engineers, students and lecturers in the fields of photonics, optics, laser physics, optoelectronics, and biophotonics.

Narrow gap semiconductors have provided an exciting field of research and show a number of extreme physical and material characteristics. They are the established material systems for infrared detectors and emitters, and with new developments in the technology these materials are emerging as a viable route to high speed, low power electronics. New kinds of narrow gap semiconductor, such as graphene and other composite nanocrystals, are also providing renewed interest in the underlying physics. The Thirteenth International Conference on Narrow Gap Semiconductors (NGS-13) was held at the University of Surrey, Guildford, UK in July 2007. The conference brought together experts and young scientists to discuss the latest findings and developments in the field. This book contains the invited and contributed papers which were presented at this meeting and serves to provide a broad overview of the current worldwide activities in
narrow gap semiconductor research. The subjects covered are theoretical and material physics of narrow gap semiconductors and quantum heterostructures, spin related phenomenon including carrier dynamics and magnetotransport, carbon nanotubes and graphene as novel narrow gap material, as well as device physics including transistors, mid and far-infrared lasers and detectors.

"a very valuable book for graduate students and researchers in the field of Laser Spectroscopy, which I can fully recommend" —Wolfgang Demtröder, Kaiserslautern University of Technology How would it be possible to provide a coherent picture of this field given all the techniques available today? The authors have taken on this daunting task in this impressive, groundbreaking text. Readers will benefit from the broad overview of basic concepts, focusing on practical scientific and real-life applications of laser spectroscopic analysis and imaging. Chapters follow a consistent structure, beginning with a succinct summary of key principles and concepts, followed by an overview of applications, advantages and pitfalls, and finally a brief discussion of seminal advances and current developments. The examples used in this text span physics and chemistry to environmental science, biology, and medicine. Focuses on practical use in the laboratory and real-world applications Covers the basic concepts, common experimental setups Highlights advantages and caveats of the
techniques. Concludes each chapter with a snapshot of cutting-edge advances. This book is appropriate for anyone in the physical sciences, biology, or medicine looking for an introduction to laser spectroscopic and imaging methodologies. Helmut H. Telle is a full professor at the Instituto Pluridisciplinar, Universidad Complutense de Madrid, Spain. Ángel González Ureña is head of the Department of Molecular Beams and Lasers, Instituto Pluridisciplinar, Universidad Complutense de Madrid, Spain.

As the editor, I feel extremely happy to present to the readers such a rich collection of chapters authored/co-authored by a large number of experts from around the world covering the broad field of guided wave optics and optoelectronics. Most of the chapters are state-of-the-art on respective topics or areas that are emerging. Several authors narrated technological challenges in a lucid manner, which was possible because of individual expertise of the authors in their own subject specialties. I have no doubt that this book will be useful to graduate students, teachers, researchers, and practicing engineers and technologists and that they would love to have it on their book shelves for ready reference at any time.

This book covers the latest progress in the field of transparent ceramics, emphasizing their processing as well as solid-state lasers. It consists of 10 chapters covering the
synthesis, characterization and compaction, fundamentals of sintering, densification of transparent ceramics by different methods as well as transparent ceramic applications. This book can be used as a reference for senior undergraduate to postgraduate students, researchers, engineers and material scientists working in solid-state physics. This is the first comprehensive book on the engineering of diamond optical devices. Written by 39 experts in the field, it gives readers an up-to-date review of the properties of optical quality synthetic diamond (single crystal and nanodiamond) and the nascent field of diamond optical device engineering. Application areas covered in detail in this book include quantum information processing, high performance lasers and light sources, and bioimaging. It provides scientists, engineers and physicists with a valuable and practical resource for the design and development of diamond-based optical devices.

This timely publication presents a review of the most recent developments in the field of Semiconductor Disk Lasers. Covering a wide range of key topics, such as operating principles, thermal management, nonlinear frequency conversion, semiconductor materials, short pulse generation, electrical pumping, and laser applications, the book provides readers with a comprehensive account of the fundamentals and latest advances in this rich and diverse field. In so doing, it brings together contributions from world experts at major collaborative research centers in Europe and the USA. Each chapter includes a tutorial style introduction to the selected topic suitable for
postgraduate students and scientists with a basic background in optics - making it of interest to a wide range of scientists, researchers, engineers and physicists working and interested in this rapidly developing field. It will also serve as additional reading for students in the field.

This book presents the latest developments in semiconducting materials and devices, providing up-to-date information on the science, processes, and applications in the field. A wide range of topics are covered, including optoelectronic devices, metal–semiconductor junctions, heterojunctions, MISFETs, LEDs, semiconductor lasers, photodiodes, switching diodes, tunnel diodes, Gunn diodes, solar cells, varactor diodes, IMPATT diodes, and advanced semiconductors. Detailed attention is paid to advanced and futuristic materials. In addition, clear explanations are provided of, for example, electron theories, high-field effects, the Hall effect, transit-time effects, drift and diffusion, breakdown mechanisms, equilibrium and transient conditions, switching, and biasing. The book is designed to meet the needs of undergraduate engineering students and will also be very useful for postgraduate students; it will assist in preparation for examinations at colleges and universities and for other examinations in engineering. Practice questions are therefore presented in both essay and multiple choice format, and many solved examples and unsolved problems are included.

An important guide to the major techniques for generating coherent light in the mid-infrared region of the spectrum Laser-based Mid-infrared Sources and Applications
gives a comprehensive overview of the existing methods for generating coherent light in the important yet difficult-to-reach mid-infrared region of the spectrum (2–20 ?m) and their applications. The book describes major approaches for mid-infrared light generation including ion-doped solid-state lasers, fiber lasers, semiconductor lasers, and laser sources based on nonlinear optical frequency conversion, and reviews a range of applications: spectral recognition of molecules and trace gas sensing, biomedical and military applications, high-field physics and attoscience, and others. Every chapter starts with the fundamentals for a given technique that enables self-directed study, while extensive references help conduct deeper research. Laser-based Mid-infrared Sources and Applications provides up-to-date information on the state-of-the-art mid-infrared sources, discusses in detail the advancements made over the last two decades such as microresonators and interband cascade lasers, and explores novel approaches that are currently subjects of intense research such as supercontinuum and frequency combs generation. This important book: • Explains the fundamental principles and major techniques for coherent mid-infrared light generation • Discusses recent advancements and current cutting-edge research in the field • Highlights important biomedical, environmental, and military applications Written for researchers, academics, students, and engineers from different disciplines, the book helps navigate the rapidly expanding field of mid-infrared laser-based technologies. In this monograph, the authors address the physics and engineering together with the
latest achievements of efficient and compact ultrafast lasers based on novel quantum-dot structures and devices. Their approach encompasses a broad range of laser systems, while taking into consideration not only the physical and experimental aspects but also the much needed modeling tools, thus providing a holistic understanding of this hot topic.

The only introductory text on the market today that explains the underlying physics and engineering applicable to all lasers. Although lasers are becoming increasingly important in our high-tech environment, many of the technicians and engineers who install, operate, and maintain them have had little, if any, formal training in the field of electro-optics. This can result in less efficient usage of these important tools. Introduction to Laser Technology, Fourth Edition provides readers with a good understanding of what a laser is and what it can and cannot do. The book explains what types of laser to use for different purposes and how a laser can be modified to improve its performance in a given application. With a unique combination of clarity and technical depth, the book explains the characteristics and important applications of commercial lasers worldwide and discusses light and optics, the fundamental elements of lasers, and laser modification. In addition to new chapter-end problems, the Fourth Edition includes new and expanded chapter material on: Material and wavelength Diode
Laser Arrays Quantum-cascade lasers Fiber lasers Thin-disk and slab lasers Ultrafast fiber lasers Raman lasers Quasi-phase matching Optically pumped semiconductor lasers Introduction to Laser Technology, Fourth Edition is an excellent book for students, technicians, engineers, and other professionals seeking a fuller, more formal introduction to the field of laser technology. Ultrashort laser pulses with durations in the femtosecond range up to a few picoseconds provide a unique method for precise materials processing or medical applications. Paired with the recent developments in ultrashort pulse lasers, this technology is finding its way into various application fields. The book gives a comprehensive overview of the principles and applications of ultrashort pulse lasers, especially applied to medicine and production technology. Recent advances in laser technology are discussed in detail. This covers the development of reliable and cheap low power laser sources as well as high average power ultrashort pulse lasers for large scale manufacturing. The fundamentals of laser-matter-interaction as well as processing strategies and the required system technology are discussed for these laser sources with respect to precise materials processing. Finally, different applications within medicine, measurement technology or materials processing are highlighted.

Vertical External Cavity Surface Emitting Lasers Provides comprehensive
coverage of the advancement of vertical-external-cavity surface-emitting lasers

Vertical-external-cavity surface-emitting lasers (VECSELs) emit coherent light from the infrared to the visible spectral range with high power output. Recent years have seen new device developments – such as the mode-locked integrated (MIXSEL) and the membrane external-cavity surface emitting laser (MECSEL) – expand the application of VECSELs to include laser cooling, spectroscopy, telecommunications, biophotonics, and laser-based displays and projectors. In Vertical External Cavity Surface Emitting Lasers: VECSEL Technology and Applications, leading international research groups provide a comprehensive, fully up-to-date account of all fundamental and technological aspects of vertical external cavity surface emitting lasers. This unique book reviews the physics and technology of optically-pumped disk lasers and discusses the latest developments of VECSEL devices in different wavelength ranges. Topics include OP-VECSEL physics, continuous wave (CW) lasers, frequency doubling, carrier dynamics in SESAMs, and characterization of nonlinear lensing in VECSEL gain samples. This authoritative volume: Summarizes new concepts of DBR-free and MECSEL lasers for the first time Covers the mode-locking concept and its application Provides an overview of the emerging concept of self-mode locking Describes the development of next-generation OPS laser products Vertical
External Cavity Surface Emitting Lasers: VECSEL Technology and Applications is an invaluable resource for laser specialists, semiconductor physicists, optical industry professionals, spectroscopists, telecommunications engineers and industrial physicists. The introduction of innovative light sources, fibre laser sources and light emitting diodes, is opening unexpected perspectives into optical techniques and is promising new exciting applications in the field of biomedicine. Lasers and Current Optical Techniques in Biology aims to provide an overview of light sources, together with an extensive and authoritative description of the optical techniques in bio-medicine. This book is designed to give biomedical researchers a strong feel for the capability of physical approaches, promote new interdisciplinary interests and persuade more practitioners to take advantage of optical techniques. Current developments in a variety of optical techniques, including Near-Infra Red Spectroscopy, and traditional and advanced fluorescence techniques are covered, ranging from those that are becoming common practice to those that need much more experimentation before they can be accepted as real breakthroughs. Further topics include optical coherence tomography and its variations, polarised light imaging and, principle laser and lamp sources- a usually fragmentary topic, often dispersed among specialist
publications. The wide range of topics covered make Lasers and Current Optical Techniques in Biology of interest to a diverse range of scientific communities. Issues in Optics, Light, Laser, Infrared, and Photonic Technology: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Optics, Light, Laser, Infrared, and Photonic Technology. The editors have built Issues in Optics, Light, Laser, Infrared, and Photonic Technology: 2011 Edition on the vast information databases of ScholarlyNews™. You can expect the information about Optics, Light, Laser, Infrared, and Photonic Technology in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Optics, Light, Laser, Infrared, and Photonic Technology: 2011 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

A major showcase for the compound semiconductor community, Compound Semiconductors 2002 presents an overview of recent developments in
compound semiconductor physics and its technological applications to devices. The topics discussed reflect the significant progress achieved in understanding and mastering compound semiconductor materials and electronic and optoelectronic devices. The book covers heteroepitaxial growth, quantum confined emitters and detectors, quantum wires and dots, ultrafast transistors, and various compound materials.

Solid-state lasers which offer multiple desirable qualities, including enhanced reliability, robustness, efficiency and wavelength diversity, are absolutely indispensable for many applications. The Handbook of solid-state lasers reviews the key materials, processes and applications of solid-state lasers across a wide range of fields. Part one begins by reviewing solid-state laser materials. Fluoride laser crystals, oxide laser ceramics, crystals and fluoride laser ceramics doped by rare earth and transition metal ions are discussed alongside neodymium, erbium and ytterbium laser glasses, and nonlinear crystals for solid-state lasers. Part two then goes on to explore solid-state laser systems and their applications, beginning with a discussion of the principles, powering and operation regimes for solid-state lasers. The use of neodymium-doped materials is considered, followed by system sizing issues with diode-pumped quasi-three level materials, erbium glass lasers, and microchip, fiber, Raman and cryogenic lasers. Laser
mid-infrared systems, laser induced breakdown spectroscopy and the clinical applications of surgical solid-state lasers are also explored. The use of solid-state lasers in defense programs is then reviewed, before the book concludes by presenting some environmental applications of solid-state lasers. With its distinguished editors and international team of expert contributors, the Handbook of solid-state lasers is an authoritative guide for all those involved in the design and application of this technology, including laser and materials scientists and engineers, medical and military professionals, environmental researchers, and academics working in this field. Reviews the materials used in solid-state lasers Explores the principles of solid-state laser systems and their applications Considers defence and environmental applications Covering fundamental principles and the state of the art, this is a collection of reviews from experts in mid-infrared (mid-IR) coherent sources. Among the sources covered are optical parametric oscillators, difference frequency generators, and the most recent broadband crystalline, quantum cascade, and fiber lasers. The authors show how advances in mid-IR science and technology make these sources indispensable for a variety of applications. Issues in Electronic Circuits, Devices, and Materials: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive
information about Microwave Research. The editors have built Issues in Electronic Circuits, Devices, and Materials: 2013 Edition on the vast information databases of ScholarlyNews™. You can expect the information about Microwave Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Electronic Circuits, Devices, and Materials: 2013 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Semiconductors and Semimetals has distinguished itself through the careful selection of well-known authors, editors, and contributors. Originally widely known as the "Willardson and Beer" Series, it has succeeded in publishing numerous landmark volumes and chapters. The series publishes timely, highly relevant volumes intended for long-term impact and reflecting the truly interdisciplinary nature of the field. The volumes in Semiconductors and Semimetals have been and will continue to be of great interest to physicists,
chemists, materials scientists, and device engineers in academia, scientific laboratories and modern industry. The series publishes timely, highly relevant volumes intended for long-term impact and reflecting the truly interdisciplinary nature of the field.

An accessible yet rigorous introduction to nanophotonics, covering basic principles, technology, and applications in lighting, lasers, and photovoltaics. Providing a wealth of information on materials and devices, and over 150 color figures, it is the 'go-to' guide for students in electrical engineering taking courses in nanophotonics.

The Encyclopedia of Modern Optics, Second Edition, provides a wide-ranging overview of the field, comprising authoritative reference articles for undergraduate and postgraduate students and those researching outside their area of expertise. Topics covered include classical and quantum optics, lasers, optical fibers and optical fiber systems, optical materials and light-emitting diodes (LEDs). Articles cover all subfields of optical physics and engineering, such as electro-optical design of modulators and detectors. This update contains contributions from international experts who discuss topics such as nanophotonics and plasmonics, optical interconnects, photonic crystals and 2D materials, such as graphene or holy fibers. Other topics of note include solar
energy, high efficiency LED’s and their use in illumination, orbital angular momentum, quantum optics and information, metamaterials and transformation optics, high power fiber and UV fiber lasers, random lasers and bio-imaging. Addresses recent developments in the field and integrates concepts from fundamental physics with applications for manufacturing and engineering/design. Provides a broad and interdisciplinary coverage of specialist areas. Ensures that the material is appropriate for new researchers and those working in a new sub-field, as well as those in industry. Thematically arranged and alphabetically indexed, with cross-references added to facilitate ease-of-use.

DBR-Free Optically Pumped Semiconductor Disk Lasers
Electrically and Optically Pumped Semiconductor Disk Lasers - Continuous-wave and Modelocked
Optically-pumped Semiconductor Disk Lasers with Intracavity Second-harmonic Generation
Optically Pumped Semiconductor Disk Lasers for High-power Wide Wavelength Tuning
Intracavity Frequency Doubling of Optically Pumped Semiconductor Disk Lasers to the Green Spectral Range
Design and Performance of Optically Pumped Semiconductor Disk Lasers with Wide Tuning Ranges
Semiconductor lasers have important applications in numerous fields, including engineering, biology, chemistry and medicine. They form the backbone of the optical telecommunications infrastructure supporting the internet, and are used in information storage devices, bar-code scanners, laser printers and many other everyday products. Semiconductor lasers:
Read Online Optically Pumped Semiconductor Disk Lasers For High Power

Fundamentals and applications is a comprehensive review of this vital technology. Part one introduces the fundamentals of semiconductor lasers, beginning with key principles before going on to discuss photonic crystal lasers, high power semiconductor lasers and laser beams, and the use of semiconductor lasers in ultrafast pulse generation. Part two then reviews applications of visible and near-infrared emitting lasers. Nonpolar and semipolar GaN-based lasers, advanced self-assembled InAs quantum dot lasers and vertical cavity surface emitting lasers are all considered, in addition to semiconductor disk and hybrid silicon lasers. Finally, applications of mid- and far-infrared emitting lasers are the focus of part three. Topics covered include GaSb-based type I quantum well diode lasers, interband cascade and terahertz quantum cascade lasers, whispering gallery mode lasers and tunable mid-infrared laser absorption spectroscopy. With its distinguished editors and international team of expert contributors, Semiconductor lasers is a valuable guide for all those involved in the design, operation and application of these important lasers, including laser and telecommunications engineers, scientists working in biology and chemistry, medical practitioners, and academics working in this field. Provides a comprehensive review of semiconductor lasers and their applications in engineering, biology, chemistry and medicine Discusses photonic crystal lasers, high power semiconductor lasers and laser beams, and the use of semiconductor lasers in ultrafast pulse generation Reviews applications of visible and near-infrared emitting lasers and mid- and far-infrared emitting lasers

Vertical-cavity surface-emitting lasers (VCSELs) emitting at 850 nm wavelength are known for their attractive optical features and a continuously growing range of applications. The main goal of the present thesis is to demonstrate the feasibility of a monolithical integration of
VCSELs with PIN-type photodiodes (PDs) for the operation as transceiver (TRx) chips in optical data links. The project milestones comprise the chip and the epitaxial layer design of the VCSEL–PIN PD device based on a traditional AlGaAs/GaAs material system, its fabrication development, electro-optical characterizations, and data transmission in a bidirectional optical link over a single, two-side butt-coupled standard graded-index (GI) multimode fiber (MMF). The monolithic design lowers the costs in the semiconductor technology as well as in packaging and additionally avoids the use of external optics, even though it is employed with a single 50 μm core diameter GI MMF. Thus, the very compact optical link saves space, weight, and module cost. Deep insights into the electro-optical properties of VCSELs and PIN PDs are given by the theoretical description and measurements. The limitations of small-signal modulation responses are of main interest of this thesis. Thus, the dynamic characteristics including the extraction of modeled parasitics are presented. Also the electrical and optical crosstalk between the integrated devices and both transmission channels as well as the fiber alignment tolerances are covered. The results in optical data transmission consisting of various experiments in half-duplex and full-duplex mode, both free-space and fiber-coupled over a single MMF are comprised. The monolithic TRx design is well suited for low-cost, compact optical links over distances of a few hundred meters. Capable to handle data rates of up to 10 Gbit/s and more, these TRx chips can be employed, e.g., to upgrade existing standard MMF networks to bidirectional operation or in mobile, low-cost, automotive networks.

Issues in Electronics Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Electronics Research and Application. The editors have built Issues in Electronics Research and Application: 2011
Edition on the vast information databases of ScholarlyNews™. You can expect the information about Electronics Research and Application in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Electronics Research and Application: 2011 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

This unique resource explains the fundamental physics of semiconductor nanolasers, and provides detailed insights into their design, fabrication, characterization, and applications. Topics covered range from the theoretical treatment of the underlying physics of nanoscale phenomena, such as temperature dependent quantum effects and active medium selection, to practical design aspects, including the multi-physics cavity design that extends beyond pure electromagnetic consideration, thermal management and performance optimization, and nanoscale device fabrication and characterization techniques. The authors also discuss technological applications of semiconductor nanolasers in areas such as photonic integrated circuits and sensing. Providing a comprehensive overview of the field, detailed design and analysis procedures, a thorough investigation of important applications, and insights into future trends, this is essential reading for graduate students, researchers, and professionals in optoelectronics, applied photonics, physics, nanotechnology, and materials science.

This new resource provides an insight into the physical principles of the device technology that
underpins many laser-based military systems in one form or another. From this knowledge a deeper understanding of the fundamental requirements and the potential performance, as well as limitations of such systems may be assessed, given the appropriate operational parameters. Engineers and students are provided with practical advice on how to evaluate laser devices and systems, operate them safely, and train with them.