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Semiconductor and Metal Nanocrystals Victor I. Klimov, 2003-11-07 The vast technological potential of nanocrystalline materials as well as current intense interest in the physics and chemistry of nanoscale phenomena has led to explosive growth in research on semiconductor nanocrystals also known as nanocrystal quantum dots and metal nanoparticles Semiconductor and Metal Nanocrystals addresses current topics impacting the field including synthesis and assembly of nanocrystals theory and spectroscopy of interband and intraband optical transitions single nanocrystal optical and tunneling spectroscopies electrical transport in nanocrystal assemblies and physical and engineering aspects of nanocrystal based devices Written by experts who have contributed pioneering research this reference comprises key advances in the field of semiconductor nanocrystal quantum dots and metal nanoparticles over the past several years Focusing specifically on nanocrystals generated through chemical techniques Semiconductor and Metal Nanocrystals Merges investigative frontiers in physics chemistry and engineering Documents advances in nanocrystal synthesis and assembly

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High-Performance Backbone Network Technology Naoaki Yamanaka, 2020-04-01 Compiling the most influential papers from the IEICE Transactions in Communications High Performance Backbone Network Technology examines critical breakthroughs in the design and provision of effective public service networks in areas including traffic control telephone service real time video transfer voice and image transmission for a content delivery network CDN and Internet access The contributors explore system structures experimental prototypes and field trials that herald the development of new IP networks that offer quality of service QoS as well as enhanced security reliability and function Offers many hints and guidelines for future research in IP and photonic backbone network technologies

Slow Light Jacob B. Khurgin, Rodney S. Tucker, 2018-10-08 One of the Top Selling Physics Books according to YBP Library Services The exotic effects of slow light have been widely observed in the laboratory However current literature fails to explore the wider field of slow light in photonic structures and optical fibers Reflecting recent research *Slow Light Science and Applications* presents a comprehensive introduction to slow light and its potential applications including storage switching DOD applications and nonlinear optics The book covers fundamentals of slow light in various media including atomic media semiconductors fibers

and photonic structures Leading authorities in such diverse fields as atomic vapor spectroscopy fiber amplifiers and integrated optics provide an interdisciplinary perspective They uncover potential applications in both linear and nonlinear optics While it is impossible to account for all the captivating developments that have occurred in the last few years this book provides an exceptional survey of the current state of the slow light field Polarimetric Radar Imaging Jong-Sen Lee, Eric Pottier, 2017-12-19 The recent launches of three fully polarimetric synthetic aperture radar PolSAR satellites have shown that polarimetric radar imaging can provide abundant data on the Earth's environment such as biomass and forest height estimation snow cover mapping glacier monitoring and damage assessment Written by two of the most recognized leaders in this field Polarimetric Radar Imaging From Basics to Applications presents polarimetric radar imaging and processing techniques and shows how to develop remote sensing applications using PolSAR imaging radar The book provides a substantial and balanced introduction to the basic theory and advanced concepts of polarimetric scattering mechanisms speckle statistics and speckle filtering polarimetric information analysis and extraction techniques and applications typical to radar polarimetric remote sensing It explains the importance of wave polarization theory and the speckle phenomenon in the information retrieval problem of microwave imaging and inverse scattering The authors demonstrate how to devise intelligent information extraction algorithms for remote sensing applications They also describe more advanced polarimetric analysis techniques for polarimetric target decompositions polarization orientation effects polarimetric scattering modeling speckle filtering terrain and forest classification manmade target analysis and PolSAR interferometry With sample PolSAR data sets and software available for download this self contained hands on book encourages you to analyze space borne and airborne PolSAR and polarimetric interferometric SAR Pol InSAR data and then develop applications using this data

Photonic MEMS Devices Ai-Qun Liu, 2018-10-08 Photonic MEMS devices represent the next major breakthrough in the silicon revolution While many quality resources exist on the optic and photonic aspect of device physics today's researchers are in need of a reference that goes beyond to include all aspects of engineering innovation An extension on traditional design and analysis Photonic MEMS Devices Design Fabrication and Control describes a broad range of optical and photonic devices from MEMS optical switches and bandgap crystal switches to optical variable attenuators VOA and injection locked tunable lasers It deals rigorously with all these technologies at a fundamental level systematically introducing critical nomenclature Each chapter also provides analysis techniques equations and experimental results The book focuses not only on traditional design analysis but also provides extensive background on realistic simulation and fabrication processes With a clear attention to experimental relevance this book provides the fundamental knowledge needed to take the next step in integrating photonic MEMS devices into commercial products and technology Handbook of Nonlinear Optics Richard L. Sutherland, 2003-04-22 Examining classic theories experimental methods and practical formulas for exploration of the core topics in nonlinear optics the second edition of this acclaimed text was extensively revised to reflect recent advances in the

analysis and modification of material properties for application in frequency conversion optical switching and limiting

Visual Information Representation, Communication, and Image Processing Ya-Qin Zhang, 1999-05-25 Discusses recent advances in the related technologies of multimedia computers videophones video over Internet HDTV digital satellite TV and interactive computer games The text analyzes ways of achieving more effective navigation techniques data management functions and higher throughput networking It synthesizes data on visual information venues tracking the enormous commercial potential for new components and compatible systems

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Semiconductor Laser Fundamentals Toshiaki Suhara, 2004-03-16 Ranging from fundamental theoretical concepts to advanced device technologies this reference text explores the engineering characteristics and performance of specific semiconductor lasers It defines key principles in electromagnetics optoelectronics and laser implementation for novel applications in optical communications storage processing

Nonlinear Optics Partha P. Banerjee, 2003-12-04 Nonlinear Optics probes in great depth quadratic and cubic nonlinearities photorefractive nonlinear optics the nonlinear optical properties of nematic liquid crystals and photonic bandgap structures This reference places core physical principles and theoretical concepts in dialogue with contemporary applications and research and presents the essential physics behind the products and promise of this very fertile field It presents new developments in the dispersion management in nonlinear optical fibers and the combined effects

of quadratic and cubic nonlinearities on harmonic generation Coverage includes a review of linear wave propagation and the origins of optical nonlinearity *Dynamic Laser Speckle and Applications* Hector J. Rabal,Roberto A. Braga Jr.,2018-10-03 Speckle study constitutes a multidisciplinary area with inherent complexities In order to conquer challenges such as the variability of samples and sensitive measurements researchers must develop a theoretical and statistical understanding of both biological and non biological metrology using dynamic speckle laser *Dynamic Laser Speckle and Applications* discusses the main methodologies used to analyze biospeckle phenomena with a strong focus on experimentation After establishing a theoretical background in both speckle and biospeckle the book presents the main methodologies for statistical and image analysis It then deals with the concept of frequency decomposition before moving on to a discussion of fuzzy methods to treat dynamic speckle data The book dedicates two sections to applications including agricultural approaches Additional features include photo images of experiments and software to aid in easy start up of dynamic speckle usage A systematic approach to new dynamic speckle laser phenomena this book provides the physical theory and statistical background needed to analyze images formed by laser illumination in biological and non biological samples **Fiber Optic Sensors** Shizhuo Yin,Francis T.S. Yu,2002-03-15 This reference presents a comprehensive account of the recent advances and research in fiber optic sensor technology It offers a progressive history of each sensor type as well as basic principles and fundamental building blocks for practical applications in the electrical aerospace defense and manufacturing smart structure undersea surveillance medical and gas and oil industries *Fiber Optic Sensors* highlights the development of fiber optic sensors and classic applications provides new methods for the construction of high speed and high capacity fiber sensor systems and describes recent developments in fiber optic amplifiers fiber Bragg grating sensors optical isolators optical time domain reflectometry OTDR and fiber optic gyroscopes The book details structural fatigue monitoring for dams and bridges the effect of external and environmental factors on fiber optic sensor performance interferometer configuration multiplexing architecture polarization fading mitigation and system integration and updated applications of fiber optic sensors

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