

Read Free Optical Networks A Practical Perspective

Optical Networks A Practical Perspective

This book is a compilation of works presenting recent developments and practical applications in optical fiber technology. It contains 13 chapters

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from various institutions that represent global research in various topics such as scattering, dispersion, polarization interference, fuse phenomena and optical manipulation, optical fiber laser and sensor applications, passive optical network (PON) and plastic optical fiber (POF) technology. It

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provides the reader with a broad overview and sampling of the innovative research on optical fiber technologies.

The book Optical Fiber and Wireless Communications provides a platform for practicing researchers, academics, PhD students, and other scientists to

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review, plan, design, analyze, evaluate, intend, process, and implement diversiform issues of optical fiber and wireless systems and networks, optical technology components, optical signal processing, and security. The 17 chapters of the book demonstrate capabilities and

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potentialities of optical communication to solve scientific and engineering problems with varied degrees of complexity.

This book takes a pragmatic approach to deploying state-of-the-art optical networking equipment in metro-core and backbone networks. The book is

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oriented towards practical implementation of optical network design. Algorithms and methodologies related to routing, regeneration, wavelength assignment, sub rate-traffic grooming and protection are presented, with an emphasis on optical-bypass-enabled (or all-optical)

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networks. The author has emphasized the economics of optical networking, with a full chapter of economic studies that offer guidelines as to when and how optical-bypass technology should be deployed. This new edition contains: new chapter on dynamic optical networking and a new chapter

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on flexible/elastic optical networks. Expanded coverage of new physical-layer technology (e.g., coherent detection) and its impact on network design and enhanced coverage of ROADM architectures and properties, including colorless, directionless, contentionless and gridless. Covers

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Hot topics, such as Software Defined Networking and energy efficiency, algorithmic advancements and techniques, especially in the area of impairment-aware routing and wavelength assignment. Provides more illustrative examples of concepts are provided, using three reference

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networks (the topology files for the networks are provided on a web site, for further studies by the reader). Also exercises have been added at the end of the chapters to enhance the book's utility as a course textbook.

How can you make multivendor services work smoothly on today's

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complex networks? This practical book shows you how to deploy a large portfolio of multivendor Multiprotocol Label Switching (MPLS) services on networks, down to the configuration level. You'll learn where Juniper Network's Junos, Cisco's IOS XR, and OpenContrail, interoperate and where

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they don't. Two network and cloud professionals from Juniper describe how MPLS technologies and applications have rapidly evolved through services and architectures such as Ethernet VPNs, Network Function Virtualization, Seamless MPLS, Egress Protection, External

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Path Computation, and more. This book contains no vendor bias or corporate messages, just solid information on how to get a multivendor network to function optimally. Topics include: Introduction to MPLS and Software-Defined Networking (SDN) The four MPLS

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Builders (LDP, RSVP-TE, IGP SPRING, and BGP) Layer 3 unicast and multicast MPLS services, Layer 2 VPN, VPLS, and Ethernet VPN Inter-domain MPLS Services Underlay and overlay architectures: data centers, NVO, and NFV Centralized Traffic Engineering and TE bandwidth

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reservations Scaling MPLS transport and services Transit fast restoration based on the IGP and RSVP-TE FIB optimization and egress service for fast restoration

Next Generation Optical Networks Harnessing Light

Optical Network Design and Planning

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Optical Fiber Telecommunications VA
Systems and Networks

Optical Fiber Telecommunications VB

*An insight into the
biometric industry and
the steps for successful
deployment Biometrics*

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technologies verify identity through characteristicssuch as fingerprints, voices, and faces. By providing increasedsecurity and convenience, biometrics

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have begun to see widespread deployment in network, e-commerce, and retail applications. This book provides in-depth analysis of biometrics as a solution

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for authenticating employees and customers. Leading authority, Samir Nanavati explores privacy, security, accuracy, system design, user perceptions, and

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lessons learned in biometric deployments. He also assesses the real-world strengths and weaknesses of leading biometric technologies: finger-

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scan, iris-scan, facial-scan, voice-scan, and signature-scan. This accessible book is a necessary step in understanding and implementing biometrics.

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Demystifies the complex world of optical networks for IT and business managers

Over the past few years, the cost of fiber optic networking has decreased,

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making it the best solution for providing virtually unlimited bandwidth for corporate LANs and WANs, metropolitan networks, Internet access, and

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*broadband to the home.
The only strategic book
on optical networking
technologies written
from a real-world
business perspective,
Optical Networking*

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demystifies complex fiber technologies for managers, and details the practical business benefits an optical network can offer. Debra Cameron explores

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established and emerging markets for optical networks aswell as the enabling technologies, applications, networkarchitectures, key deployment issues,

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and cost considerations. She also provides in-depth case studies of optical networks now in use in the United States and abroad.

Modeling, Simulation,

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Design and Engineering of WDM Systems and Networks provides readers with the basic skills, concepts, and design techniques used to begin design and

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engineering of optical communication systems and networks at various layers. The latest semi-analytical system simulation techniques are applied to optical

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WDM systems and networks, and a review of the various current areas of optical communications is presented. Simulation is mixed with experimental

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verification and engineering to present the industry as well as state-of-the-art research. This contributed volume is divided into three

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parts, accommodating different readers interested in various types of networks and applications. The first part of the book presents modeling

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approaches and simulation tools mainly for the physical layer including transmission effects, devices, subsystems, and systems), whereas the

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second part features more engineering/design issues for various types of optical systems including ULH, access, and in-building systems. The third part of the

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book covers networking issues related to the design of provisioning and survivability algorithms for impairment-aware and multi-domain networks.

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Intended for professional scientists, company engineers, and university researchers, the text demonstrates the effectiveness of computer-aided design

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when it comes to network engineering and prototyping.

**Bestselling author Regis "Bud" Bates utilizes a market-driven, "business needs"*

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*approach to optical communications *Provides a concise analysis of systems and options without being overly technical and translates complicated jargon into*

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*clear business terms
*Includes applications
and implementation of
technologies, regulatory
and standards
developments, product
photos and descriptions,*

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generic pricing, and business models
Optical Networking Best Practices Handbook
presents optical networking in a very comprehensive way for

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nonengineers needing to understand the fundamentals of fiber, high-capacity, high-speed equipment and networks, and upcoming carrier services. The

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book provides a practical understanding of fiber optics as a physical medium, sorting out single-mode versus multi-mode and the crucial concept of Dense

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*Wave-Division
Multiplexing.
Fiber Optics Engineering
Elastic Optical Networks
Architectures,
Technologies, and
Control*

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*Identity Verification in
a Networked World*

Optical Code Division

Multiple Access

23rd IFIP WG 6.10

International

Conference, ONDM 2019,

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*Athens, Greece, May
13–16, 2019, Proceedings*

*This is the first edition of
'The Engineering of Reliable
Embedded Systems': it is
released here largely for
historical reasons. (Please*

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consider purchasing 'ERES2' instead.) [The second edition will be available for purchase here from June 2017.]

A self-contained guide to OCDMA for Next-Generation FTTH systems, from the

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fundamentals to cutting-edge research and practical perspectives.

Applications of optical switching in network elements and communication networks are discussed in considerable depth. Optical

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circuits, packet, and burst switching are all included. Composed of distinct self-contained chapters with minimum overlaps and independent references. Provides up-to-date comprehensive coverage of

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*optical switching,
technologies, devices,
systems and networks.*

*Discusses applications of
optical switching in network
elements and communications
networks.*

An expert guide to the new

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and emerging field of broadband circuits for optical fiber communication
This exciting publication makes it easy for readers to enter into and deepen their knowledge of the new and emerging field of broadband

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circuits for optical fiber communication. The author's selection and organization of material have been developed, tested, and refined from his many industry courses and seminars. Five types of

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*broadband circuits are discussed in detail: **
*Transimpedance amplifiers **
*Limiting amplifiers **
*Automatic gain control (AGC) amplifiers **
*Lasers drivers **
Modulator drivers
Essential background on

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optical fiber, photodetectors, lasers, modulators, and receiver theory is presented to help readers understand the system environment in which these broadband circuits operate. For each

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circuit type, the main specifications and their impact on system performance are explained and illustrated with numerical values. Next, the circuit concepts are discussed and illustrated

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with practical implementations. A broad range of circuits in MESFET, HFET, BJT, HBT, BiCMOS, and CMOS technologies is covered. Emphasis is on circuits for digital, continuous-mode transmission in the 2.5

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to 40 Gb/s range, typically used in SONET, SDH, and Gigabit Ethernet applications. Burst-mode circuits for passive optical networks (PON) and analog circuits for hybrid fiber-coax (HFC) cable-TV

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*applications also are discussed. Learning aids are provided throughout the text to help readers grasp and apply difficult concepts and techniques, including: **
*Chapter summaries that highlight the key points **

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*Problem-and-answer sections to help readers apply their newknowledge * Research directions that point to exciting new technologicalbreakthroughs on the horizon * Product examples that show the*

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*performance of actual
broadbandcircuits *
Appendices that cover eye
diagrams, differential
circuits, Sparameters,
transistors, and
technologies * A
bibliography that leads*

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readers to more complete and in-depth treatment of specialized topics This is a superior learning tool for upper-level undergraduates and graduate-level students in circuit design and optical fiber communication.

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Unlike other texts that concentrate on analog circuits in general or mostly on optics, this text provides balanced coverage of electronic, optic, and system issues. Professionals in the fiber optic industry

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will find it an excellent reference, incorporating the latest technology and discoveries in the industry.

Fundamental Optical Phenomena and Applications Interoperable Scenarios to

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Make Networks Scale to New Services

Advances in Optical Fiber Technology

OFDM for Optical Communications

High-Speed and Lower Power Technologies

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Components and Subsystems

Passive optical network (PON) technologies have become an important broadband access technology as a result of the growing demand for bandwidth-hungry video-on-demand applications. Written by

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the leading researchers and industry experts in the field, Passive Optical Networks provides coherent coverage of networking technologies, fiber optic transmission technologies, as well as the electronics involved in PON system development. Features:

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An in-depth overview of PON technologies and the potential applications that they enable
Comprehensive review of all major PON standards and architecture evolutions, as well as their pros and cons
Balanced coverage of recent

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research findings with economic and engineering considerations Presents system issues of protocols, performance, management and protection Extensive references to standards and research materials for further studies This book provides

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an authoritative overview of PON technologies and system requirements and is ideal for engineers and managers in industry, university researchers, and graduate students. Balances treatment of the optical technologies with systems

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issues such as protocols, performance, management and protection Covers latest developments in WDM-PONS, protection switching, dynamic bandwidth allocation Practical coverage with a chapter on PON

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applications and deployment Case studies on implementing PONs
In this book the reader will find a collection of 31 papers presenting different facets of Human Computer Interaction, the result of research projects and experiments as well as

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new approaches to design user interfaces. The book is organized according to the following main topics in a sequential order: new interaction paradigms, multimodality, usability studies on several interaction mechanisms,

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human factors, universal design and development methodologies and tools.

This handbook is an authoritative, comprehensive reference on optical networks, the backbone of today's communication and information

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society. The book reviews the many underlying technologies that enable the global optical communications infrastructure, but also explains current research trends targeted towards continued capacity scaling and enhanced networking flexibility

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in support of an unabated traffic growth fueled by ever-emerging new applications. The book is divided into four parts: Optical Subsystems for Transmission and Switching, Core Networks, Datacenter and Super-Computer Networking, and

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Optical Access and Wireless Networks. Each chapter is written by world-renown experts that represent academia, industry, and international government and regulatory agencies. Every chapter provides a complete picture of its

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field, from entry-level information to a snapshot of the respective state-of-the-art technologies to emerging research trends, providing something useful for the novice who wants to get familiar with the field to the expert who wants to get a concise

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view of future trends.

This book presents fundamental passive optical network (PON) concepts, providing you with the tools needed to understand, design, and build these new access networks. The logical

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sequence of topics begins with the underlying principles and components of optical fiber communication technologies used in access networks. Next, the book progresses from descriptions of PON and fiber-to-the-X (FTTX)

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alternatives to their application to fiber-to-the-premises (FTTP) networks and, lastly, to essential measurement and testing procedures for network installation and maintenance. An Instructor's Manual presenting detailed solutions

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**to all the problems in the book is
available from the Wiley
editorial department.**

**Modeling, Simulation, Design and
Engineering
Optical Switching
Content Networking**

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Biometrics

Electronics and Photonics

Optical Networking Best Practices Handbook

Tomorrow's networks will integrate optical transmission and IP to deliver unprecedented performance and

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manageability. Next Generation Optical Networks gives both electrical and data networking engineers essential information for building these networks. It reviews emerging standards such as MPLS and MPLmS, key optical technologies, and critical applications for enterprise, ISP, and carrier environments.

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This book is intended as a graduate/post graduate level textbook for courses on high-speed optical networks as well as computer networks. The ten chapters cover basic principles of the technology as well as latest developments and further discuss network security, survivability, and reliability of optical networks and

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priority schemes used in wavelength routing. This book also goes on to examine Fiber To The Home (FTTH) standards and their deployment and research issues and includes examples in all the chapters to aid the understanding of problems and solutions. Presents advanced concepts of optical network devices

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Includes examples and exercises in all the chapters of the book to aid the understanding of basic problems and solutions for undergraduate and postgraduate students Discusses optical ring metropolitan area networks and queuing system and its interconnection with other networks Discusses routing and

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wavelength assignment Examines restoration schemes in the survivability of optical networks

As the Internet has grown, so have the challenges associated with delivering static, streaming, and dynamic content to end-users. This book is unique in that it addresses the topic of content networking

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exclusively and comprehensively, tracing the evolution from traditional web caching to today's open and vastly more flexible architecture. With this evolutionary approach, the authors emphasize the field's most persistent concepts, principles, and mechanisms--the core information that will help you understand why and how

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content delivery works today, and apply that knowledge in the future. + Focuses on the principles that will give you a deep and timely understanding of content networking. + Offers dozens of protocol-specific examples showing how real-life Content Networks are currently designed and implemented. + Provides extensive

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consideration of Content Services, including both the Internet Content Adaptation Protocol (ICAP) and Open Pluggable Edge Services (OPES). + Examines methods for supporting time-constrained media such as streaming audio and video and real-time media such as instant messages. + Combines the vision

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and rigor of a prominent researcher with the practical experience of a seasoned development engineer to provide a unique combination of theoretical depth and practical application.

Research and development on optical wavelength-division multiplexing (WDM) networks have matured considerably.

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While optics and electronics should be used appropriately for transmission and switching hardware, note that "intelligence" in any network comes from "software," for network control, management, signaling, traffic engineering, network planning, etc. The role of software in creating powerful

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network architectures for optical WDM networks is emphasized. Optical WDM Networks is a textbook for graduate level courses. Its focus is on the networking aspects of optical networking, but it also includes coverage of physical layers in optical networks. The author introduces WDM and its enabling technologies and

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discusses WDM local, access, metro, and long-haul network architectures. Each chapter is self-contained, has problems at the end of each chapter, and the material is organized for self study as well as classroom use. The material is the most recent and timely in capturing the state-of-the-art in the fast-moving field of optical

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WDM networking.

Optical Network Design and Modeling

Broadband Circuits for Optical Fiber

Communication

WDM Systems and Networks

Optical Bit Error Rate

FTTX Concepts and Applications

Optical WDM Networks

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This book explores up-to-date research trends and achievements on low-power and high-speed technologies in both electronics and optics. It offers unique insight into low-power and high-speed approaches

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ranging from devices, ICs, sub-systems and networks that can be exploited for future mobile devices, 5G networks, Internet of Things (IoT), and data centers. It collects heterogeneous topics in place to catch and predict future

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research directions of devices, circuits, subsystems, and networks for low-power and higher-speed technologies. Even it handles about artificial intelligence (AI) showing examples how AI technology can

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be combined with concurrent electronics. Written by top international experts in both industry and academia, the book discusses new devices, such as Si-on-chip laser, interconnections using

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graphenes, machine learning combined with CMOS technology, progresses of SiGe devices for higher-speed electronics for optic, co-design low-power and high-speed circuits for optical interconnect,

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low-power network-on-chip (NoC) router, X-ray quantum counting, and a design of low-power power amplifiers. Covers modern high-speed and low-power electronics and photonics. Discusses novel nano-devices,

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electronics & photonic sub-systems for high-speed and low-power systems, and many other emerging technologies like Si photonic technology, Si-on-chip laser, low-power driver for optic device, and network-on-chip

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router. Includes practical applications and recent results with respect to emerging low-power systems. Addresses the future perspective of silicon photonics as a low-power interconnections and

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communication applications. Using simple language, this text explains the properties of light, its interaction with matter, and how it is used to develop optical components such as filters and multiplexers that have

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applications in optical communications. The text also introduces the evolving dense wavelength division multiplexing (DWDM) technology and communications systems. This book constitutes the

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refereed proceedings of the 23rd International IFIP conference on Optical Network Design and Modeling, ONDM 2019, held in Athens, Greece, in May 2019. The 39 revised full papers were carefully reviewed and selected

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from 87 submissions. The papers focus on cutting-edge research in established areas of optical networking as well as their adoption in support of a wide variety of new services and applications. This involves the

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most recent trends in networking including 5G and beyond, big data and network data analytics, cloud/edge computing, autonomic networking, artificial intelligence assisted networks, secure and resilient networks,

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that drive the need for increased capacity, efficiency, exhibility and adaptability in the functions that the network can perform. In this context new disaggregated optical network architectures were discussed, exploiting and

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integrating novel multidimensional photonic technology solutions as well as adopting open hardware and software platforms relying on software defined networking (SDN), and network function

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virtualization (NFV) to allow support of new business models and opportunities.

Optical science and engineering affect almost every aspect of our lives. Millions of miles of optical fiber carry voice and data signals

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around the world. Lasers are used in surgery of the retina, kidneys, and heart. New high-efficiency light sources promise dramatic reductions in electricity consumption. Night-vision equipment and satellite

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surveillance are changing how wars are fought. Industry uses optical methods in everything from the production of computer chips to the construction of tunnels. Harnessing Light surveys this multitude of

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applications, as well as the status of the optics industry and of research and education in optics, and identifies actions that could enhance the field's contributions to society and facilitate its continued technical

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development.

Optical Networks:A Practical Perspective, 2e

Optical Switching and Networking Handbook

TMN

Optical Science and Engineering

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for the 21st Century
Architecture, Protocols, and
Practice

Advances in Optical Networks
and Components

Within the past few decades,
information technologies

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have been evolving at a tremendous rate, causing profound changes to our world and our ways of life. In particular, fiber optics has been playing an increasingly crucial role within the telecommunication

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revolution. Not only most long-distance links are fiber based, but optical fibers are increasingly approaching the individual end users, providing wide bandwidth links to support all kinds of data-intensive

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applications such as video, voice, and data services. As an engineering discipline, fiber optics is both fascinating and challenging. Fiber optics is an area that incorporates elements from a wide range of technologies

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including optics, microelectronics, quantum electronics, semiconductors, and networking. As a result of rapid changes in almost all of these areas, fiber optics is a fast evolving field. Therefore, the need

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for up-to-date texts that address this growing field from an interdisciplinary perspective persists. This book presents an overview of fiber optics from a practical, engineering perspective. Therefore, in

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addition to topics such as lasers, detectors, and optical fibers, several topics related to electronic circuits that generate, detect, and process the optical signals are covered. In other words, this book

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attempts to present fiber optics not so much in terms of a field of "optics" but more from the perspective of an engineering field within "optoelectronics.

The third edition of Optical Networks continues to be the

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authoritative source for information on optical networking technologies and techniques. Componentry and transmission are discussed in detail with emphasis on practical networking issues that affect organizations as

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they evaluate, deploy, or develop optical networks. New updates in this rapidly changing technology are introduced. These updates include sections on pluggable optical transceivers, ROADM

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(reconfigurable optical add/drop multiplexer), and electronic dispersion compensation. Current standards updates such as G.709 OTN, as well as, those for GPON, EPON, and BPON are featured. Expanded

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discussions on multimode fiber with additional sections on photonic crystal and plastic fibers, as well as expanded coverage of Ethernet and Multiprotocol Label Switching (MPLS). This book clearly explains all

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the hard-to-find information on architecture, control and management. It serves as your guide at every step of optical networking-- from planning to implementation through ongoing maintenance. This book is your key to

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thoroughly understanding practical optical networks. In-depth coverage of optimization, design, and management of the components and transmission of optical networks. Filled with examples, figures, and

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problem sets to aid in development of dependable, speedy networks. Focuses on practical, networking-specific issues: everything you need to know to implement currently available optical solutions.

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The first book on optical OFDM by the leading pioneers in the field The only book to cover error correction codes for optical OFDM Gives applications of OFDM to free-space communications, optical access networks, and

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metro and log haul transports show optical OFDM can be implemented Contains introductions to signal processing for optical engineers and optical communication fundamentals for wireless engineers This

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book gives a coherent and comprehensive introduction to the fundamentals of OFDM signal processing, with a distinctive focus on its broad range of applications. It evaluates the architecture, design and

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performance of a number of OFDM variations, discusses coded OFDM, and gives a detailed study of error correction codes for access networks, 100 Gb/s Ethernet and future optical networks. The emerging applications of

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optical OFDM, including single-mode fiber transmission, multimode fiber transmission, free space optical systems, and optical access networks are examined, with particular attention paid to passive

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optical networks, radio-over-fiber, WiMAX and UWB communications. Written by two of the leading contributors to the field, this book will be a unique reference for optical communications engineers and

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scientists. Students, technical managers and telecom executives seeking to understand this new technology for future-generation optical networks will find the book invaluable. William Shieh is

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an associate professor and reader in the electrical and electronic engineering department, The University of Melbourne, Australia. He received his M.S. degree in electrical engineering and Ph.D. degree in physics both

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from University of Southern California. Ivan Djordjevic is an Assistant Professor of Electrical and Computer Engineering at the University of Arizona, Tucson, where he directs the Optical Communications

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Systems Laboratory (OCSL). His current research interests include optical networks, error control coding, constrained coding, coded modulation, turbo equalization, OFDM applications, and quantum

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error correction. "This wonderful book is the first one to address the rapidly emerging optical OFDM field. Written by two leading researchers in the field, the book is structured to comprehensively cover any

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optical OFDM aspect one could possibly think of, from the most fundamental to the most specialized. The book adopts a coherent line of presentation, while striking a thoughtful balance between the various

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topics, gradually developing the optical-physics and communication-theoretic concepts required for deep comprehension of the topic, eventually treating the multiple optical OFDM methods, variations and

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applications. In my view this book will remain relevant for many years to come, and will be increasingly accessed by graduate students, accomplished researchers as well as telecommunication

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engineers and managers keen to attain a perspective on the emerging role of OFDM in the evolution of photonic networks." -- Prof. Moshe Nazarathy, EE Dept., Technion, Israel Institute of Technology * The first

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book on optical OFDM by the leading pioneers in the field * The only book to cover error correction codes for optical OFDM *

Applications of OFDM to free-space communications, optical access networks, and

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metro and long haul
transports show optical OFDM
can be implemented * An
introduction to signal
processing for optical
communications * An
introduction to optical
communication fundamentals

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for the wireless engineer

This book presents advances in the field of optical networks - specifically on research and applications in elastic optical networks (EON). The material reflects the authors' extensive

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research and industrial activities and includes contributions from preeminent researchers and practitioners in optical networking. The authors discuss the new research and applications that address

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the issue of increased bandwidth demand due to disruptive, high bandwidth applications, e.g., video and cloud applications. The book also discusses issues with traffic not only increasing but becoming much

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more dynamic, both in time and direction, and posits immediate, medium, and long-term solutions throughout the text. The book is intended to provide a reference for network architecture and planning,

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communication systems, and control and management approaches that are expected to steer the evolution of EONs.

The Convergence of IP Intelligence and Optical Technologies

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Passive Optical Networks
Optical Fiber and Wireless
Communications

A Practical Perspective
Principles and Practice

Human-Computer Interaction

Optical Bit Error Rate:

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An Estimation

Methodology provides an analytical methodology to the estimation of bit error rate of optical digital signals. This presents an extremely

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important subject in the design of optical communications systems and networks, yet previous to the publication of this book the topic had not been

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covered holistically.
The text lays out an easy-to-understand analytical approach to a highly important and complex subject: bit error rate (BER)

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estimation of a transmitted signal with a focus on optical transmission. It includes coverage of such important topics as impairments on DWDM

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optical signals, causes of signal distortion, and identification and estimation of the signal quality by statistical estimation of the bit error rate. The book

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includes numerous illustrations and examples to make a difficult topic easy to understand. This edition includes a CD-ROM with run-time simulations

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from a vendor that
provides commercial
software for the
industry.

Optical Fiber

Telecommunications V

(A&B) is the fifth in a

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series that has chronicled the progress in the research and development of lightwave communications since the early 1970s. Written by active authorities from

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academia and industry, this edition not only brings a fresh look to many essential topics but also focuses on network management and services. Using high

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bandwidth in a cost-effective manner for the development of customer applications is a central theme. This book is ideal for R&D engineers and managers,

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optical systems
implementers, university
researchers and
students, network
operators, and the
investment community.

Volume (A) is devoted to

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components and
subsystems, including:
semiconductor lasers,
modulators,
photodetectors,
integrated photonic
circuits, photonic

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crystals, specialty fibers, polarization-mode dispersion, electronic signal processing, MEMS, nonlinear optical signal processing, and quantum

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information
technologies. Volume (B)
is devoted to systems
and networks, including:
advanced modulation
formats, coherent
systems, time-

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**multiplexed systems,
performance monitoring,
reconfigurable add-drop
multiplexers, Ethernet
technologies, broadband
access and services,
metro networks, long-**

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haul transmission,
optical switching,
microwave photonics,
computer
interconnections, and
simulation tools.
Biographical Sketches

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Ivan Kaminow retired from Bell Labs in 1996 after a 42-year career. He conducted seminal studies on electrooptic modulators and materials, Raman

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scattering in
ferroelectrics,
integrated optics,
semiconductor lasers
(DBR , ridge-waveguide
InGaAsP and multi-
frequency), birefringent

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optical fibers, and WDM networks. Later, he led research on WDM components (EDFAs, AWGs and fiber Fabry-Perot Filters), and on WDM local and wide area

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networks. He is a member of the National Academy of Engineering and a recipient of the IEEE/OSA John Tyndall, OSA Charles Townes and IEEE/LEOS Quantum

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Electronics Awards.

**Since 2004, he has been
Adjunct Professor of
Electrical Engineering
at the University of
California, Berkeley.**

Tingye Li retired from

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AT&T in 1998 after a 41-year career at Bell Labs and AT&T Labs. His seminal work on laser resonator modes is considered a classic. Since the late 1960s, He

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and his groups have conducted pioneering studies on lightwave technologies and systems. He led the work on amplified WDM transmission systems and

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championed their deployment for upgrading network capacity. He is a member of the National Academy of Engineering and a foreign member of the Chinese Academy of

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Engineering. He is a recipient of the IEEE David Sarnoff Award, IEEE/OSA John Tyndall Award, OSA Ives Medal/Quinn Endowment, AT&T Science and

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Technology Medal, and IEEE Photonics Award. Alan Willner has worked at AT&T Bell Labs and Bellcore, and he is Professor of Electrical Engineering at the

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University of Southern
California. He received
the NSF Presidential
Faculty Fellows Award
from the White House,
Packard Foundation
Fellowship, NSF National

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Young Investigator
Award, Fulbright
Foundation Senior
Scholar, IEEE LEOS
Distinguished Lecturer,
and USC University-Wide
Award for Excellence in

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Teaching. He is a Fellow of IEEE and OSA, and he has been President of the IEEE LEOS, Editor-in-Chief of the IEEE/OSA J. of Lightwave Technology, Editor-in-Chief of

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**Optics Letters, Co-Chair
of the OSA Science &
Engineering Council, and
General Co-Chair of the
Conference on Lasers and
Electro-Optics.**

Optical NetworksA

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**Practical
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expanded second edition
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they evaluate, deploy, or develop optical solutions. This book captures all the hard-to-find information on architecture, control and management, and

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other communications topics that will affect you every step of the way—from planning to decision-making to implementation to ongoing maintenance. If

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your goal is to thoroughly understand practical optical networks, this book should be your first and foremost resource. *

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networking-specific issues: everything you need to know to implement currently available optical solutions. * Provides the transmission and

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component details you need to understand and assess competing technologies. * Offers updated and expanded coverage of propagation, lasers and optical

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switching technology,
network design,
transmission design, IP
over WDM, wavelength
routing, optical
standards, and more.
Mathematical Principles

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of Optical Fiber
Communication
Fundamentals, Design,
Control, and Management
MPLS in the SDN Era
Telecommunications
Management Network

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Data in a Rainbow

The rapid growth in communications and internet has changed our way of life, and our requirement for communication bandwidth. Optical networks can

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enable us to meet the continued demands for this bandwidth, although conventional optical networks struggle in achieving this, due to the limitation of the electrical bandwidth barrier.

Flexgrid technology is a

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promising solution for future high-speed network design. To promote an efficient and scalable implementation of elastic optical technology in the telecommunications infrastructure, many challenging

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issues related to routing and spectrum allocation (RSA), resource utilization, fault management and quality of service provisioning must be addressed. This book reviews the development of elastic

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optical networks (EONs), and addresses RSA problems with spectrum fragment issues, which degrade the quality of service provisioning. The book starts with a brief introduction to optical fiber transmission system, and

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then provides an overview of the wavelength division multiplexing (WDM), and WDM optical networks. It discusses the limitations of conventional WDM optical networks, and discusses how EONs overcome these

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limitations. It presents the architecture of the EONs and its operation principle. To complete the discussion of network architecture, this book focuses on the different node architectures, and compares

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their performance in terms of scalability and flexibility. It reviews and classifies different RSA approaches, including their pros and cons. It focuses on different aspects related to RSA. The spectrum fragmentation is a

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serious issue in EONs, which needs to be managed. The book explains the fragmentation problem in EONs, discusses, and analyzes the major conventional spectrum allocation policies in terms of the

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fragmentation effect in a network. The taxonomies of the fragmentation management approaches are presented along with different node architectures. State-of-the-art fragmentation management approaches are

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looked at. A useful feature of this book is that it provides mathematical modeling and analyzes theoretical computational complexity for different problems in elastic optical networks. Finally, this

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book addresses the research challenges and open issues in EONs and provides future directions for future research. Covering optical networks from building to building, city to city, and country to country, this book

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takes an in-depth look at optimization, design, and management of the components and transmission of optical networks.

The fourth edition of Optical Networks continues the tradition

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of being the authoritative source on optical networking technologies and techniques. Uniquely emphasizing practical networking issues that affect organizations as they evaluate, deploy, or develop optical

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networks, Optical Networks serve as your guide for every step of optical networking--from planning to implementation through ongoing maintenance. Optical communications has undergone a sea change since

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the 3rd edition was published. The advent and rapid commercialization of high-speed coherent optics with advanced modulation formats completely changed the way network architecture and link design are

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conceived and implemented. All of these and more are now discussed in this 4th edition, offering a comprehensive view of a state-of-the-art optical network. Changes to this edition include:
Legacy protocols and systems

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that are being phased out are de-emphasized, and new trends, such as data-centric networks are added to bring current perspectives on optical communication and networks. Addresses the most recent

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trends especially in coherent systems, new fiber types, and Ethernet protocols, ROADMs, client interfaces, and coherent optics. Explores the significant advances in electronic chips, line systems, transmissions systems,

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client/short reach optics, subsea networks, and network design and architecture. Covers advanced topics such as CDC ROADM, hybrid amplifiers, and 400G. Provides a practical perspective on optical networks

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written by experts with significant real-world industry experience. Every chapter updated with new descriptions and technological developments. Provides an excellent tool as both a reference for practitioners and textbook for

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students. Filled with examples, figures, and problem sets to aid in development of dependable, speedy networks.

Introduction to optical networks --
Propagation of signals in optical
fiber -- Components --

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Modulation and demodulation --
Transmission system
engineering -- Client layers of the
optical layer -- WDM network
elements -- WDM network
design -- Control and
management -- Network

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survivability -- Access networks
-- Photonic packet switching --
Deployment considerations.
The Engineering of Reliable
Embedded Systems (LPC1769)
An Estimation Methodology
Springer Handbook of Optical

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Networks

Introduction to DWDM

Technology

Handbook of Optimization in
Telecommunications

Optical Networks

This comprehensive handbook

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brings together experts who use optimization to solve problems that arise in telecommunications. It is the first book to cover in detail the field of optimization in telecommunications. Recent

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optimization developments that are frequently applied to telecommunications are covered. The spectrum of topics covered includes planning and design of telecommunication networks, routing, network

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protection, grooming, restoration, wireless communications, network location and assignment problems, Internet protocol, World Wide Web, and stochastic issues in telecommunications.

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The book 's objective is to provide a reference tool for the increasing number of scientists and engineers in telecommunications who depend upon optimization.

TMN is a network monitoring

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system that allows telecommunications providers to monitor every element of their networks. While TMN is a powerful tool for controlling telecommunication networks, it is difficult to manage. This is

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the book that helps telecommunications managers effectively use TMN.

This book is intended to support and promote interdisciplinary research in optical fiber communications by providing

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essential background in both the physical and mathematical principles of the discipline. It is written to be as independent as possible while taking the reader to the frontiers of research on fiber optics communications.