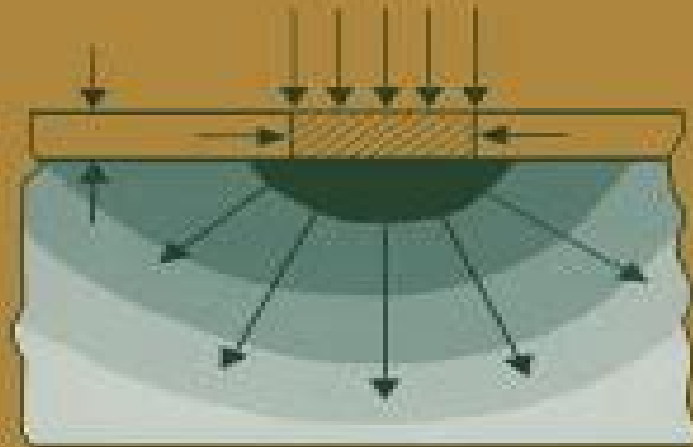


Kurt Schwartz

The Physics of Optical Recording



Springer-Verlag

The Physics Of Optical Recording

Shan X. Wang, Alex M. Taratorin



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The Physics of Optical Recording Kurt Schwartz, 2012-02-23 Optics and optical recording have a long history Already in the ancient temples of Egypt and in Stonehenge optical imaging was used in religious ceremonies As early as the 17th century optical instruments such as the telescope and the microscope played a crucial role in the development of the natural sciences which in turn altered humanity's perception of itself and the universe Nowadays the science of optics is not only a means of gathering information but also of information transfer analysis and processing Our reliance on optical computing has become crucial since 1982 when compact discs CD's first became widely available Optical memory discs CD ROM read only memory WORM write once read many and erasable read write discs are now produced industrially However WORM and erasable discs comprise only a small field of optical imaging and information processing Recent research into optical recording introduced new horizons for optical computing and real time information processing such as three dimensional holographic memory time domain holography nonlinear optical filtering etc The development of these unique possibilities is conceivable only with new recording materials and novel recording processes For such progress one should be familiar with the pen and paper of optical recording the laser and the optical medium Thus this book will be a guide to novel applications of optical recording materials The reader will find a description of the principles of optical recording and optical processing which allow him to find novel applications for information storage and optical imaging

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The Physical Principles of Magneto-optical Recording Masud Mansuripur, 1998-07-30 First time paperback of successful and well reviewed book for graduate students and researchers in

physics and engineering *Optical Near-Field Recording* Junji Tominaga,Takashi Nakano,2005-12-08 Optical disc industry is one of the successful businesses in the world and huge amounts of discs and drives have been spread all over the world More than a billion discs are produced and distributed every year Since the first optical discs Laser Discs and Compact Discs CD were shipped in the early 1980s they have rapidly dominated the world music market and DVDs will replace the video tape market in the near future The optical disc and drive technologies consist of the most advanced and integrated systems with regard to optics physics chemistry mathematics electronics mechanics and related subjects a huge number of scientists and engineers have engaged in the research and development of the systems One of the key factors of the development of the optical disc systems of course results in the availability of cheap stable and reliable semiconductor laser units Now you can store data up to 4.7GB on a single side of the 12 cm DVD and in the near future blue laser technology will allow storage of more than 20GB on the same size disc We should not however forget the other core technologies such as focusing the beam on the surface of a spinning disc precisely and encoding and decoding digital data The data capacity of optical discs has increased from 0.65GB to 25GB by the year 2003 and we certainly believe it will continue to increase with new technologies

The Physics of Ultra-High-Density Magnetic Recording M.L. Plumer,J. van Ek,D. Weller,2012-12-06 In this book 17 experts in magnetic recording focus on the underlying physical mechanisms that play crucial roles in medium and transducer development for high areal density disk drives In 11 chapters an examination is made of the fundamental physical concepts and their impact on recording mechanisms with special emphasis on thin film longitudinal perpendicular patterned and nanoparticle media Theoretical and experimental investigations are presented which serve to enhance our basic understanding of thin film dynamics medium dynamics and thermal effects Fundamental aspects of magnetotransport are discussed and an overview is given of recording head designs **Coding and Signal Processing for Magnetic Recording Systems**

Bane Vasic,Erozan M. Kurtas,2004-11-09 Implementing new architectures and designs for the magnetic recording read channel have been pushed to the limits of modern integrated circuit manufacturing technology This book reviews advanced coding and signal processing techniques and architectures for magnetic recording systems Beginning with the basic principles it examines read write operations data organization head positioning sensing timing recovery data detection and error correction It also provides an in depth treatment of all recording channel subsystems inside a read channel and hard disk drive controller The final section reviews new trends in coding particularly emerging codes for recording channels

The Science of Sound Recording Jay Kadis,2012-09-10 The Science of Sound Recording will provide you with more than just an introduction to sound and recording it will allow you to dive right into some of the technical areas that often appear overwhelming to anyone without an electrical engineering or physics background The Science of Sound Recording helps you build a basic foundation of scientific principles explaining how recording really works Packed with valuable must know information illustrations and examples of worked through equations this book introduces the theory behind sound recording

practices in a logical and practical way while placing an emphasis on the concepts of measurement as they relate to sound recording physical principles of mechanics and acoustics biophysics of hearing introduction to electronics analog and digital recording theory and how science determines mixing techniques

Photorefractive Materials for Dynamic Optical Recording Jaime Frejlich, 2020-02-05 A comprehensive and up to date reference on holographic recording Photorefractive Materials for Dynamic Optical Recording offers a comprehensive overview of the physics technology and characterization of photorefractive materials that are used for optical recording The author a noted expert on the topic offers an exploration of both transient and permanent holographic information storage methods The text is written in clear terms with coherent explanations of the different methods that allows for easy access to the most appropriate method for a specific need The book provides an analysis of the fundamental properties of the materials and explores the dynamic recording of a spatial electric charge distribution and the associated spatial electric field distribution The text also includes information on the characterization of photorefractive materials using holographic and nonholographic optical methods and electrical techniques reporting a large number of actual experimental results on a variety of materials This important resource Offers an in depth source of information on the physics and technology of all relevant holographic recording methods Contains text written by a pioneer in the field Jaime Frejlich s research defined the field of dynamic holographic recording Presents a one stop resource that covers all phenomena and methods Includes a review of the practical applications of the technology Written for materials scientists solid state physicists optical physicists physicists in industry and engineering scientists Photorefractive Materials for Dynamic Optical Recording offers a comprehensive resource on the topic from the groundbreaking expert in the field

Proceedings of the Tenth International Workshop on the Physics of Semiconductor Devices : (December 14 - 18, 1999) [New Delhi]. 2(2000) ,2000

Magnetic Information Storage Technology Shan X. Wang, Alex M. Taratorin, 1999-05-24 This text explains how hard disk drives operate how billions of bytes of digital information are stored and accessed and where the technology is going In particular the book emphasizes the most fundamental principles of magnetic information storage including in depth knowledge of both magnetics and signal processing methods Magnetic Information Storage Technology contains many graphic illustrations and an introduction of alternative storage technologies such as optic disk recording holographic recording semiconductor flash memory and magnetic random access memory Provides the fundamentals of magnetic information storage and contrasts it with a comparison of alternative storage technologies Addresses the subject at the materials device and system levels Addresses the needs of the multi billion dollar a year magnetic recording and information storage industry Emphasizes both theoretical and experimental concepts Condenses current knowledge on magnetic information storage technology into one self contained volume Suitable for undergraduate and graduate students as well as seasoned researchers engineers and professionals in data and information storage fields

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