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Not just a fascinating

overview of the science of liquid crystals - which is presented in simple enough terms for the lay person to grasp while rarely being patronising - "Soap, Science, and Flat-Screen TVs" also

succeeds in telling the very human stories behind the scientific papers, providing a wonderful insight into academic life over a century spanning two world wars and some astonishing

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Soap, Science, and Flat-Screen TVs: A History of Liquid ...

Soap, Science, and Flat-Screen TVs. A History

of Liquid Crystals. David Dunmur and Tim Sluckin. Description. The terms 'liquid crystal' or 'liquid crystal display, LCD, are recognized in the context of flat-screen televisions, but the properties

and history of liquid crystals are little known. This book tells the story of liquid crystals, from their controversial discovery at the end of the nineteenth century, to their eventual

acceptance as another state of matter to rank alongside gases, ...

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Soap, Science, and Flat-Screen TVs chronicles the triumphs and

bitter feuds that led to understanding that there is indeed a fourth state of matter, even before the invention of X-ray diffraction had put the nature of crystals beyond doubt.

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socio-economic background of the individuals and institutions that make up the story."--Bill Crossland, Times Higher Education Supplement.

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The terms 'liquid crystal' or 'liquid crystal display' (LCD) are recognized in the context of flat-screen televisions, but the properties and history of liquid crystals are little known. This book

tells the story of liquid crystals, from their controversial discovery at the end of the nineteenth century, to their eventual acceptance as another state of matter to rank alongside gases,

liquids, and solids. As their story unfolds, the scientists involved and their works are put into illuminating broader socio-political contexts. In recent years, liquid crystals have had a major

impact on the display industry, culminating in the now widely available flat-screen televisions. This development is described in detail over three chapters, and the basic science behind

it is explained in simple terms accessible to a general reader. New applications of liquid crystals in materials, biosystems, medicine, and technology are also explained. The authors' approach to the

subject defines a new genre of popular science books. The historical background to the scientific discoveries is given in detail, and the personal communications between the scientists involved are

explored. The book tells the story of liquid crystals, but it also shows that scientific discovery and exploitation relies on human interactions, and the social and political environments in which they

operate.

The presence of liquid crystal displays (LCDs) marks the advances in mobile phones and television development over the last few decades. Japanese companies were

the first to commercialize passive-matrix TNLCDs and, later on, high-resolution activematrix LCDs.Prof. Shunsuke Kobayashi has made essential contributions to Japan's prominence in

LCD development throughout this period. He is well-known not only for his own groundbreaking research, but also for the training of many prominent figures in the display industry, both in Japan and in

other countries.This book brings together many prominent researchers in the field of liquid crystal science and technology, to share with us the key developments in LCD over the

last few decades. It comprises of five categories – from basic physics and chemistry of liquid crystals, to detailed descriptions of alignment technologies, wide viewing angle

technologies, LC optics, and display applications.The Slottow-Owaki Prize is awarded for outstanding contributions to the education and training of students and professionals in the field of information

displays. This year, the award recipient is Dr. Hoi-Sing Kwok, SID fellow and professor at Hong Kong University, for providing education and training in display technology to many students

and professionals in Asia through the creation of a display research center at the Hong Kong University of Science and Technology.

This book focuses on the development of

liquid crystal displays (LCDs) and liquid crystal materials (LCs) in Japan. The Committee of Organic Materials Research for Information Sciences of the Japan Society for the

Promotion of Science (JSPS) planned the book to document essential LCD innovations and developments since the beginnings of the field-effect LCD technology in 1970. The book illustrates the remarkable

effort and progress behind those flat, lightweight, and high-information-content LCDs that have become the indispensable human–machine interface for virtually all electronic devices. In

contrast to other publications on this topic, the book illustrates the interdisciplinary character of the LCD technology and its crucial importance for technological progress of the field far beyond

displays. It also gives insights into breakthrough innovations not revealed in other publications. Moreover, prospects for the development of LC research toward new fields of

applications are provided. In line with its interdisciplinary character, the book targets researchers in basic science as well as engineers and researchers in industry.

There is a lot

of confusion and misconception concerning science. The nature and contents of science is an unsettled problem. For example, Thales of 2,600 years ago is recognized as the father of

science but the word science was introduced only in the 14th century; the definition of science is often avoided in books about philosophy of science. This book aims to clear up all these confusions and present new

developments in the philosophy, history, sociology and communication of science. It also aims to showcase the achievement of China's top scholars in these areas. The 18 chapters, divided into five parts, are

written by prominent scholars including the Nobel laureate Robin Warren, sociologist Harry Collins, and physicist-turned-historian Dietrich Stauffer.

What does cotton

candy, which dissolves at the touch, have in common with Kevlar, used for bullet-proof vests? How can our understanding of such materials help us to tackle essential problems of the 21st century?

Materials play a key role in our search for solutions to many pressing issues. They underpin many industries, are critical for the development of consumer goods, are essential components of medical

diagnostic techniques, offer hope for the treatment of currently incurable diseases, and provide answers to environmental problems. This handbook is a guide to the materials we rely on for the

future. Materials for the 21st Century serves as a useful resource for undergraduate and high school students preparing for a career in physical sciences, life sciences,or

engineering, by helping them to identify new areas of interest. It is also an excellent reference for readers interested in learning more about the diverse range of materials that

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Handbook of Optoelectronics offers a self-contained reference from the basic

science and light sources to devices and modern applications across the entire spectrum of disciplines utilizing optoelectronic technologies. This second edition gives a complete update

of the original work with a focus on systems and applications. Volume I covers the details of optoelectronic devices and techniques including semiconductor lasers, optical detectors and

receivers, optical fiber devices, modulators, amplifiers, integrated optics, LEDs, and engineered optical materials with brand new chapters on silicon photonics,

nanophotonics, and graphene optoelectronics. Volume II addresses the underlying system technologies enabling state-of-the-art communications, imaging, displays, sensing, data

processing, energy conversion, and actuation. Volume III is brand new to this edition, focusing on applications in infrastructure, transport, security, surveillance, environmental

monitoring, military, industrial, oil and gas, energy generation and distribution, medicine, and free space. No other resource in the field comes close to its breadth and depth, with contributions

from leading industrial and academic institutions around the world. Whether used as a reference, research tool, or broad-based introduction to the field, the Handbook offers everything you

need to get started. (The previous edition of this title was published as Handbook of Optoelectronics, 9780750306461.) John P. Dakin, PhD, is professor (emeritus) at the Optoelectronics

Research Centre, University of Southampton, UK. Robert G. W. Brown, PhD, is chief executive officer of the American Institute of Physics and an adjunct full professor in the Beckman Laser Institute and

Medical Clinic at the University of California, Irvine.

This book explores the principles, design, and image processing of multi-primary displays, and introduces the

reader to the intricacies of the typical imaging pathways which influence display design and the perception of color within a display system. Early chapters introduce the concepts behind human

perception, color science, and lighting, which are necessary to fully understand multi-primary displays. The reader is also introduced to digital capture and transmission systems to better

understand the ecosystem in which multi-primary displays exist. Subsequent chapters introduce the reader to current display technologies, including LCD, OLED, and inorganic LED

displays. The working principles, performance, and upcoming advances are discussed for each of these technologies to provide the reader with a clear understanding of the tradeoffs

which are necessary when considering multi-primary displays. This discussion is followed by an in-depth discussion of the image processing technology necessary to implement multi-

primary displays. The book concludes with chapters that clearly discuss the advantages and limitations of multi-primary displays for direct view, virtual reality, and augmented reality

displays. The book provides a broad viewpoint across the entire display ecosystem, explaining the interactions among system components to provide a rationale for the further development of

multi-primary displays. Whether the reader is interested in broadening their understanding of display systems or the development of multi-primary displays, the text provides and

understandable and practical summary of important display system concepts.

While it is responsible for today’s abundance of flat screens—on televisions, computers, and

mobile devices—most of us have only heard of it in the ubiquitous acronym, LCD, with little thought as to exactly what it is: liquid crystal. In this book, Esther Leslie enlightens us,

offering an accessible and fascinating look at—not a substance, not a technology—but a wholly different phase of matter. As she explains, liquid crystal is a curious material phase that organizes a substance's

molecules in a crystalline form yet allows them to move fluidly like water. Observed since the nineteenth century, this phase has been a deep curiosity to science and, in more recent times, the key to a new era of

media technology. In between that time, as Leslie shows, it has figured in cultural forms from Romantic landscape painting to snow globes, from mountaineering to eco-disasters, and

from touchscreen devices to DNA. Expertly written but accessible, Liquid Crystals recounts the unheralded but hugely significant emergence of this unique form of matter.

DNA Nanoscience:

From Prebiotic Origins to Emerging Nanotechnology melds two tales of DNA. One is a look at the first 35 years of DNA nanotechnology to better appreciate what lies ahead in this emerging

field. The other story looks back 4 billion years to the possible origins of DNA which are shrouded in mystery. The book is divided into three parts comprised of 15 chapters and two Brief Interludes. Part

I includes subjects underpinning the book such as a primer on DNA, the broader discipline of nanoscience, and experimental tools used by the principals in the narrative. Part II examines the

field of structural DNA nanotechnology, founded by biochemist/crystallographer Nadrian Seeman, that uses DNA as a construction material for nanoscale structures and devices, rather than as a

genetic material. Part III looks at the work of physicists Noel Clark and Tommaso Bellini who found that short DNA (nanoDNA) forms liquid crystals that act as a structural gatekeeper,

orchestrating a series of self-assembly processes using nanoDNA. This led to an explanation of the polymeric structure of DNA and of how life may have emerged from the prebiotic clutter.