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1. Abundance and Measurement of Stable Isotopes. 1.1. Discovery of Isotopes. 1.2. Nuclide Types, Abundances, and Atomic Weights. 1.3. Properties and Fractionation of Isotopic Molecules. 1.4. Material Balance Relationships. 1.5. Mass Spectrometers. 1.6. Notation and Standards. 1.7. Summary. 1.8. Problems. References. 2. Isotopic Exchange and Equilibrium Fractionation. 2.1. Isotopic Exchange Reactions. 2.2. Basic Equations. 2.3. Molecular Models. 2.4. Theory of Isotopic Fractionation. 2.5. Temperature Dependence of Isotopic Fractionation Factors. 2.6. Rule of the Mean. 2.7. Isotopic Thermometers.

Publisher Description

This new edition of Bioenergetics presents a clear and up-to-date explanation of the chemiosmotic theory and covers mitochondria, bacteria, and chloroplasts. It takes account of the many newly determined structures, such as ATP synthase and the two photosystems of photosynthesis, that provide molecular insight into chemiosmotic energy transduction. This edition includes additional color figures of protein structures and many newly drawn illustrations designed to enable the reader to grasp the fundamental insights that are derived from knowing the structure. Every chapter has been extensively revised and updated and a new

chapter on the study of the bioenergetics of mitochondria in the intact cell is included to satisfy the enormous interest in this topic. Written for students and researchers alike, this book is the most current text on the chemiosmotic theory and membrane bioenergetics available. Key Features * Chapter on the study of bioenergetics of mitochondria in the intact cell * Appendix listing protein structure resources * Additional colour plates of protein structures * Many newly drawn illustrations * Website

As the Proceedings of the 1984 Canadian Mathematical Society's Summer Seminar, this book focuses on some advances in the theory of semisimple Lie algebras and some direct outgrowths of that theory. The following papers are of particular interest: an important survey article by R. Block and R. Wilson on restricted simple Lie algebras, a survey of universal enveloping algebras of semisimple Lie algebras by W. Borho, a course on Kac-Moody Lie algebras by I. G. Macdonald with an extensive bibliography of this field by Georgia Benkart, and a course on formal groups by M. Hazewinkel. Because of the expository surveys and courses, the book will be especially useful to graduate students in Lie theory, as well as to researchers in the field.

As the title implies, this is a straightforward approach to intermediate algebra that guides the student step-by-step toward acquiring mathematical skills with

examples, exercises, and more examples and exercises. The book is first and foremost student oriented. It does not dwell on formalities but appeals to intuition. Geometric arguments are favored wherever possible. Textual explanations are precise, brief, and to the point and are always accompanied by illustrative examples.

With contribution by numerous experts

"...the text is user friendly to the topics it considers and should be very accessible...Instructors and students of statistical measure theoretic courses will appreciate the numerous informative exercises; helpful hints or solution outlines are given with many of the problems. All in all, the text should make a useful reference for professionals and students."—The Journal of the American Statistical Association

The application of microfluidics to biotechnology is an exciting new area that has already begun to revolutionize how researchers study and manipulate macromolecules like DNA, proteins and cells in vitro and within living organisms. Now in a newly revised and expanded second edition, the Artech House bestseller, Microfluidics for Biotechnology brings you to the cutting edge of this burgeoning field. Among the numerous updates, the second edition features three entirely new chapters on: non-dimensional numbers in microfluidics; interface, capillarity and microdrops; and digital, two-phase and droplet microfluidics.Presenting an enlightening balance of numerical approaches, theory, and experimental examples, this book provides a detailed look at the mechanical behavior of the different types of micro/nano particles and macromolecules that are used in biotechnology. You gain a solid understanding

of microfluidics theory and the mechanics of microflows and microdrops. The book examines the diffusion of species and nanoparticles, including continuous flow and discrete Monte-Carlo methods.This unique volume describes the transport and dispersion of biochemical species and particles. You learn how to model biochemical reactions, including DNA hybridization and enzymatic reactions. Moreover, the book helps you master the theory, applications, and modeling of magnetic beads behavior and provides an overview of self-assembly and magnetic composite. Other key topics include the electric manipulation of micro/nanoparticles and macromolecules and the experimental aspects of biological macromolecule manipulation.

The Migraine Brain provides a general overview of the history of migraine, its pathophysiology, as well as in-depth details on the Clinical Perspectives and the different imaging techniques in use (MR, fMRI, DTI, VBM, PET, fMRI, and MEG). It also includes details on modulation of the brain using such techniques as TMS. The book concludes with a discussion of future uses of imaging in the diagnosis and treatment of migraines and other headaches.

This book provides a detailed overview of the current state of knowledge regarding the pathophysiology of both primary headaches – migraine, tension-type headache (TTH), and cluster headache – and the very important and frequent type of secondary headache, medication overuse headache (MOH). After an introductory chapter describing relevant neuroanatomy and vascular anatomy, the evidence gained from animal models regarding the pathophysiology of migraine and the other primary headaches is reviewed. Knowledge of the genetic component in the different types of headache is then examined with reference to recent evidence, for example regarding the implication of the trigeminovascular system and cortical spreading depression in migraine. Detailed information is provided on insights into

primary headaches from imaging studies, including functional magnetic resonance imaging and positron emission tomography and on their neurophysiology and biochemistry. A further series of important chapters describe present knowledge of the pathophysiology of each specific type of headache and consider future directions. Written by acknowledged experts in their fields from Europe and the United States, clinicians and students will find Pathophysiology of Headaches to be an excellent source of up-to-date information on why patients experience headaches. In addition, it will be of value for pain researchers investigating the underlying mechanisms of headache.

There are two crucial issues in the treatment and management of headache patients: More than 50% of individuals experiencing headache have only been treated symptomatically, with no appropriate diagnosis established; and history and neurologic examination are essential to establishing a diagnosis, and thus selecting appropriate therapy. Headache and Migraine Biology and Management is a practical text that addresses these issues, featuring contributions from expert clinical authors. The book covers in detail topics including chronic and episodic migraine, post-traumatic headache, sinus headache, cluster headache, tension headache, and others. Chapters are also dedicated to treatment subjects, including psychiatric and psychological approaches, medication overuse, inpatient treatment, and pediatric issues. This book is an ideal resource for researchers and clinicians, uniting practical discussion of headache biology, current ideas on etiology, future research, and genetic significance and breakthroughs. This resource is useful to those who want to understand headache biology, treat and manage symptoms, and for those performing research in the headache field. A practical discussion of headache biology, current ideas on etiology, future research, and

genetic significance and breakthroughs Features chapters from leading physicians and researchers in headache medicine Full-color text that includes both an overview of multiple disciplines and discusses the measures that can be used to treat headaches

Data transfer, Data media, Syntax, Coding (data conversion), Messages, Data transmission, Data structures, Data layout, Maintenance, Character sets, Data representation, Information exchange, Electronic data interchange

Aimed at graduate students, research logicians and mathematicians, this much-awaited text covers over 40 years of work on relative classification theory for nonstandard models of arithmetic. The book covers basic isomorphism invariants: families of type realized in a model, lattices of elementary substructures and automorphism groups.

Pituitary Adenylate Cyclase-Activating Polypeptide is the first volume to be written on the neuropeptide PACAP. It covers all domains of PACAP from molecular and cellular aspects to physiological activities and promises for new therapeutic strategies. Pituitary Adenylate Cyclase-Activating Polypeptide is the twentieth volume published in the Endocrine Updates book series under the Series Editorship of Shlomo Melmed, MD.

This latest volume of the Frontiers in Headache Research series summarizes the several promising new avenues for the development of future drugs for the treatment of migraine.

Increasing numbers of physicists, chemists, and mathematicians are moving into biology, reading literature across disciplines, and mastering novel biochemical concepts. To succeed in this transition, researchers must understand on a practical level what is experimentally feasible. The number of experimental techniques in biology is vast and often s

Dust is a ubiquitous feature of the cosmos, impinging directly or indirectly on most fields of

modern astronomy and astrophysics. Dust in the Galactic Environment, Second Edition provides a thorough overview of the subject, covering general concepts, methods of investigation, important results and their significance, relevant literature, and some suggestions for promising avenues of future research. Since the publication of the first edition of this popular graduate text, major advances have been made in our understanding of astrophysical dust, especially in the light of exciting new results from space- and ground-based telescopes, together with advances in laboratory astrophysics and theoretical modeling. This new, expanded edition highlights the latest results and provides a context for future research opportunities. The first chapter provides a historical perspective for current research and an overview of interstellar environments and the role of dust in astrophysical processes, followed by a discussion of the cosmic history of the chemical elements expected to be present in dust and an examination of the effect of gas-dust interactions on gas phase abundances. The next several chapters describe the observed properties of interstellar grains, such as their extinction, polarization, absorption, and emission characteristics. Then, the book explores the origin and evolution of dust, tracing its life cycle in a succession of environments from circumstellar shells to diffuse interstellar clouds, molecular clouds, protostars, and protoplanetary disks. The final chapter summarizes progress toward a unified model. Dust in other galaxies is discussed as an integral part of the text rather than as a distinct topic requiring separate chapters. Containing extensive references and problems to aid understanding and illustrate basic principles, the book is ideally suited for graduate and advanced undergraduate courses. It will also be an invaluable reference for postgraduate students and researchers working in this important field.

Stable isotope ratio variation in natural systems reflects the dynamics of Earth systems processes and imparts isotope labels to Earth materials. Carbon isotope ratios of atmospheric CO2 record exchange of carbon between the biosphere and the atmosphere; the incredible journeys of migrating monarchs is documented by hydrogen isotopes in their wings; and water carries an isotopic record of its source and history as it traverses the atmosphere and land surface. Through these and many other examples, improved understanding of spatio-temporal isotopic variation in Earth systems is leading to innovative new approaches to scientific problem-solving. This volume provides a comprehensive overview of the theory, methods, and applications that are enabling new disciplinary and cross-disciplinary advances through the study of "isoscapes": isotopic landscapes. "This impressive new volume shows scientists deciphering and using the natural isotope landscapes that subtly adorn our spaceship Earth.", Brian Fry, Coastal Ecology Institute, Louisiana State University, USA "An excellent timely must read and must-have reference book for anybody interested or engaged in applying stable isotope signatures to questions in e.g. Anthropology, Biogeochemistry, Ecology, or Forensic Science regarding chronological and spatial movement, changes, or distribution relating to animals, humans, plants, or water.", Wolfram Meier-Augenstein, Centre for Anatomy & Human Identification, University of Dundee, UK "Natural resources are being affected by global change, but exactly where, how, and at what pace? Isoscapes provide new and remarkably precise answers.", John Hayes, Woods Hole Oceanographic Institution, USA "This exciting volume is shaping a new landscape in environmental sciences that is utilizing the remarkable advances in isotope research to enhance and extend the capabilities of the field.", Dan Yakir, Weizmann Institute of Science, Israel

This monograph is concerned with the relationships between Maltsev conditions, commutator theories and the shapes of congruence lattices in varieties of algebras. The authors develop the theories of the strong commutator, the rectangular commutator, the strong rectangular commutator, as well as a solvability theory for the nonmodular TC commutator. They prove that a residually small variety that satisfies a congruence identity is congruence modular.

Kings and misers, princes and paupers, wise men and foolish boys, the funniest and oddest men and women come alive in this sparkling new collection of stories. The clever princess will only marry the man who can ask her a question she cannot answer; the orphan boy outwits his greedy uncles with a bag of ash; and an old couple in distress is saved by a magic drum. Sudha Murty’s grand parents told her some of these stories when she was a child; others she heard from her friends from around the world. These delightful and timeless folk tales have been her favourites for years, and she has recounted them many times over to the young people in her life. With this collection, they will be enjoyed by many more readers, of all ages.

Thoroughly updated for currency and with exciting new practical examples throughout, this popular text provides the tools, practice, and basic knowledge for

success in the biotech workforce. With its balanced coverage of basic cell and molecular biology, fundamental techniques, historical accounts, new advances, and hands-on applications, the Third Edition emphasizes the future of biotechnology and the biotechnology student's role in that future. Two new features-Forecasting the Future, and Making a Difference-along with several returning hallmark features, support the new focus.

You know what happened during the financial crisis … now it is time to understand why the financial system came so close to falling over the edge of the abyss and why it could happen again. Wall Street has been saved, but it hasn't been reformed. What is the problem? Suzanne McGee provides a penetrating look at the forces that transformed Wall Street from its traditional role as a capital-generating and economy-boosting engine into a behemoth operating with only its own short-term interests in mind and with reckless disregard for the broader financial system and those who relied on that system for their well being and prosperity. Primary among these influences was "Goldman Sachs envy": the self-delusion on the part of Richard Fuld of Lehman Brothers, Stanley O'Neil of Merrill Lynch, and other power brokers (egged on by their shareholders) that taking more risk would enable their companies to make even more money than Goldman Sachs. That hubris—and that narrow-minded focus on maximizing their

short-term profits—led them to take extraordinary risks that they couldn't manage and that later severely damaged, and in some cases destroyed, their businesses, wreaking havoc on the nation's economy and millions of 401(k)s in the process. In a world that boasted more hedge funds than Taco Bell outlets, McGee demonstrates how it became ever harder for Wall Street to fulfill its function as the financial system's version of a power grid, with capital, rather than electricity, flowing through it. But just as a power grid can be strained beyond its capacity, so too can a "financial grid" collapse if its functions are distorted, as happened with Wall Street as it became increasingly self-serving and motivated solely by short-term profits. Through probing analysis, meticulous research, and dozens of interviews with the bankers, traders, research analysts, and investment managers who have been on the front lines of financial booms and busts, McGee provides a practical understanding of our financial "utility," and how it touches everyone directly as an investor and indirectly through the power—capital—that makes the economy work. Wall Street is as important to the economy and the overall functioning of our society as our electric and water utilities. But it doesn't act that way. The financial system has been saved from destruction but as long as the mind-set of "chasing Goldman Sachs" lingers, it will not have been reformed. As banking undergoes its biggest transformation since the 1929 crash

and the Great Depression, McGee shows where it stands today and points to where it needs to go next, examining the future of those financial institutions supposedly “too big to fail.”

This book covers the most recent developments in the field of osteochondral tissue engineering (OCTE) and covers in detail the concepts and current challenges for bone and cartilage repair and regeneration. Specific topics include viscosupplementation, biologicals, tissue engineering approaches, in vitro and in vivo models, and technological advances with stem cells, bioreactors, and microfluidics. Osteochondral Tissue Engineering: Challenges, Current Strategies, and Technological Advances presents challenges and strategies in the field of osteochondral regeneration and serves as a core reference for biomedical engineering students and a wide range of established researchers and professionals working in orthopedics.

Chasing Goldman SachsHow the Masters of the Universe Melted Wall Street Down...And Why They'll Take Us to the Brink AgainCurrency

Cambridge Literature is a series of literary texts edited for study by students aged 14-18 in English-speaking classrooms. It includes novels, poetry, short stories, and essays. The series is extensive and open-ended, and provides school students with a range of edited texts taken from a wide geographical spread. It includes writing in English from various genres and

differing times. Moments of Madness is edited by Frank Myszor, Lecturer in English, Itchen Sixth Form College, Southampton.

This collection of eleven papers covers a broad spectrum of topics in analysis, from the study of certain classes of analytic functions to the solvability of singular problems for differential and integral equations to computational schemes for the partial differential equations and singular integral equations.

This book covers both the technological development and biomedical applications of NADH fluorescence. Topics covered include perspectives on the history of monitoring NADH fluorescence, the relationship between mitochondrial function and other functions at the tissue level, responses of NADH to physiological and pathophysiological conditions, monitoring of NADH in the human brain and other organs, and metabolism. It also includes an in-depth look at flavoprotein (Fp) fluorescence and NADH in relation to redox state. This is an ideal book for biomedical engineers, researchers, and graduate students interested in learning the biomedical applications of NADH fluorescence. This book also: Covers multisite monitoring of NADH, as well as multiparametric responses of NADH to physiological and pathophysiological conditions, and monitoring of various organs in various animal models Describes the relationship between brain activation (i.e. epileptic activity and cortical spreading depression) and NADH redox state Presents the effects of hypoxia,hyperbaric hyperoxia, and ischemia on brain NADH fluorescence and other tissue physiological parameters About the Author Avraham Mayevsky, Ph.D. is a Professor Emeritus in theFaculty of Life Sciences and the Brain Research Center at Bar Ilan University, Israel. He has published more than two hundred papers in the field of mitochondrial function and tissue physiology in vivo under

pathophysiological conditions.

The utility of congruence lattices in revealing the structure of general algebras has been recognized since Garrett Birkhoff's pioneering work in the 1930s and 1940s. However, the results presented in this book are of very recent origin: most of them were developed in 1983. The main discovery presented here is that the lattice of congruences of a finite algebra is deeply connected to the structure of that algebra. The theory reveals a sharp division of locally finite varieties of algebras into six interesting new families, each of which is characterized by the behavior of congruences in the algebras. The authors use the theory to derive many new results that will be of interest not only to universal algebraists, but to other algebraists as well. The authors begin with a straightforward and complete development of basic tame congruence theory, a topic that offers great promise for a wide variety of investigations. They then move beyond the consideration of individual algebras to a study of locally finite varieties. A list of open problems closes the work.

Written by leading scientists in the field and intended for a broader readership, this is an ideal starting point for an overview of current research and developments. As such, the book covers a broad spectrum of laboratory astrophysics and chemistry, describing recent advances in experiments, as well as theoretical work, including fundamental physics and modeling chemical networks. For researchers as well as students and newcomers to the field. From the contents: The Astrophysical Background Molecular Spectroscopy Gas Phase Chemistry Molecular Photodissociation Surface Science Dust and Nanoparticle Spectroscopy Formation of Nanoparticles and Solids