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Bioenergetics is a term used to describe the events of primary energy transduction in biology. The field has seen tremendous advances in recent years thanks to developments in the biophysical and computational techniques used to solve the three-dimensional structures of the membrane-bound proteins, which often act as catalysts in these reactions. This has enabled researchers to bring, otherwise static, structures to life and decipher the dynamic function of these intriguing systems. Biophysical and Structural Aspects of Bioenergetics brings together contributions from internationally respected experts, all of whom helped shape and develop the field of bioenergetics. It provides a representative snapshot of the very latest key developments in this multidisciplinary subject, with an emphasis on molecular structure, and how this changes during the bioenergetic function. Offering a comprehensive overview of the current state of the art, and complete with extensive citations in each chapter, this book is the ideal reference for both biochemists and biophysicists studying this fascinating topic.

Focusing on developments from the past 10-15 years, this volume presents an objective overview of the research in charge density analysis. The most promising methodologies are included, in addition to powerful interpretative tools and a survey of important areas of research.

Build on your existing programming skills and upskill to professional-level C# programming. Summary In Code Like A Pro in C# you will learn: Unit testing and test-driven development Refactor a legacy .NET codebase Principles of clean code Essential backend architecture skills Query and manipulate databases with LINQ and Entity Framework Core Critical business applications worldwide are written in the versatile C# language and the powerful .NET platform, running on desktops, cloud systems, and Windows or Linux servers. Code Like a Pro in C# makes it easy to turn your existing abilities in C# or another OO language (such as Java) into practical C# mastery. There's no "Hello World" or Computer Science 101 basics—you'll learn by refactoring an out-of-date legacy codebase, using new techniques, tools, and best practices to bring it up to modern C# standards. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology You know the basics, now get ready for the next step! Pro-quality C# code is efficient, clean, and fast. Whether you're building user-facing business applications or writing data-intensive backend services, the experience-based, practical techniques in this book will take your C# skills to a new level. About the book Code Like a Pro in C# teaches you to how write clean C# code that's suitable for enterprise applications. In this book, you'll refactor a legacy codebase by applying modern C# techniques. You'll explore tools like Entity Framework Core, design techniques like dependency injection, and key practices like testing and clean coding. It's a perfect path to upgrade your existing C# skills or shift from another

OO language into C# and the .NET ecosystem. What's inside Unit testing and test-driven development Refactor a legacy .NET codebase Principles of clean code Query and manipulate databases with LINQ and Entity Framework Core About the reader For developers experienced with object-oriented programming. No C# experience required. About the author Jort Rodenburg is a software engineer who has taught numerous courses on getting up to speed with C# and .NET. Table of Contents PART 1 USING C# AND .NET 1 Introducing C# and .NET 2 .NET and how it compiles PART 2 THE EXISTING CODEBASE 3 How bad is this code? 4 Manage your unmanaged resources! PART 3 THE DATABASE ACCESS LAYER 5 Setting up a project and database with Entity Framework Core PART 4 THE REPOSITORY LAYER 6 Test-driven development and dependency injection 7 Comparing objects 8 Stubbing, generics, and coupling 9 Extension methods, streams, and abstract classes PART 5 THE SERVICE LAYER 10 Reflection and mocks 11 Runtime type checking revisited and error handling 12 Using IAsyncEnumerable and yield return PART 6 THE CONTROLLER LAYER 13 Middleware, HTTP routing, and HTTP responses 14 JSON serialization/deserialization and custom model binding

This volume explores the use of mass spectrometry for biomedical applications. Chapters focus on specific therapeutic areas such as oncology, infectious disease and psychiatry. Additional chapters focus on methodology as well as new technologies and instrumentation. This volume provides readers with a comprehensive and informative manual that will allow them to appreciate mass spectrometry and proteomic research but also to initiate and improve their own work. Thus the book acts as a technical guide but also a conceptual guide to the newest information in this exciting field. Mass spectrometry is the central tool used in proteomic research today and is rapidly becoming indispensable to the biomedical scientist. With the completion of the human genome project and the genomic revolution, the proteomic revolution has followed closely behind. Understanding the human proteome has become critical to basic and clinical biomedical research and holds the promise of providing comprehensive understanding of human physiological processes. In addition, proteomics and mass spectrometry are bringing unprecedented biomarker discovery and are helping to personalize medicine.

This timely book is the first to provide a comprehensive overview of all important aspects of this modern technology with the focus on the "green aspect". The expert authors present everything from reactions without solvents to nanostructures for separation methods, from combinatorial chemistry on solid phase to dendrimers. The result is a ready reference packed full of valuable facts on the latest developments in the field - high-quality information otherwise widely spread throughout articles and reviews. From the contents: * Green chemistry for sustainable development * New synthetic methodologies and the demand for adequate separation processes * New developments in separation processes * Future trends and needs It is a "must-have" for every researcher in the field.

Scanning Nonlinear Dielectric Microscopy: Investigation of Ferroelectric, Dielectric, and Semiconductor Materials and Devices is the definitive reference on an important tool to characterize ferroelectric, dielectric and semiconductor materials. Written by the inventor, the book reviews the methods for applying the technique to key materials applications, including the measurement of ferroelectric materials at the atomic scale and the visualization and measurement of semiconductor materials and devices at a high level of sensitivity. Finally, the book reviews new insights this technique has given to material and device physics in ferroelectric and semiconductor materials. The book is appropriate for those involved in the development of ferroelectric, dielectric and semiconductor materials devices in academia and industry. Presents an in-depth look at the SNDM materials characterization technique by its inventor Reviews key materials applications, such as measurement of ferroelectric materials at the nanoscale and measurement of semiconductor materials and devices Analyzes key insights on semiconductor materials and device physics derived from the SNDM technique

This book is the only single volume to deal with all aspects of gram–positive pathogens. It addresses the mechanisms of gram–positive bacterial pathogenicity, including the current knowledge on gram–positive structure and mechanisms of antibiotic resistance. Emphasizing streptococci, staphylococci, listeria, and spore–forming pathogens, Gram–Positive Pathogens includes chapters written by many of the leading researchers in these areas. The chapters systematically dissect these organisms biologically, genetically, and immunologically in an attempt to understand the strategies used by these bacteria to cause human disease.

Google Earth Engine ApplicationsMDPI

In a rapidly changing world, there is an ever-increasing need to monitor the Earth's resources and manage it sustainably for future generations. Earth observation from satellites is critical to provide information required for informed and timely decision making in this regard. Satellite-based earth observation has advanced rapidly over the last 50 years, and there is a plethora of satellite sensors imaging the Earth at finer spatial and spectral resolutions as well as high temporal resolutions. The amount of data available for any single location on the Earth is now at the petabyte-scale. An ever-increasing capacity and computing power is needed to handle such large datasets. The Google Earth Engine (GEE) is a cloud-based computing platform that was established by Google to support such data processing. This facility allows for the storage, processing and analysis of spatial data using centralized high-power computing resources, allowing scientists, researchers, hobbyists and anyone else interested in such fields to mine this data and understand the changes occurring on the Earth's surface. This book presents research that applies the Google Earth Engine in mining, storing, retrieving and processing spatial data for a variety of applications that include vegetation monitoring, cropland mapping, ecosystem assessment, and gross primary productivity, among others. Datasets used range from coarse spatial resolution data, such as MODIS, to medium resolution datasets (Worldview -2), and the studies cover the entire globe at varying spatial and temporal scales.

When scholars discuss the medieval past, the temptation is to become immersed there, to deepen our appreciation of the nuances of the medieval sources through debate about their meaning. But the past informs the present in a myriad of ways and medievalists can, and should, use their research to address the concerns and interests of contemporary society. This volume presents a number of carefully commissioned essays that demonstrate the fertility and originality of recent work in Medieval Studies. Above all, they have been selected for

relevance. Most contributors are in the earlier stages of their careers and their approaches clearly reflect how interdisciplinary methodologies applied to Medieval Studies have potential repercussions and value far beyond the boundaries of the Middles Ages. These chapters are powerful demonstrations of the value of medieval research to our own times, both in terms of providing answers to some of the specific questions facing humanity today and in terms of much broader considerations. Taken together, the research presented here also provides readers with confidence in the fact that Medieval Studies cannot be neglected without a great loss to the understanding of what it means to be human.

Microbial cell wall structures play a significant role in maintaining cells' shape, as protecting layers against harmful agents, in cell adhesion and in positive and negative biological activities with host cells. All prokaryotes, whether they are bacteria or archaea, rely on their surface polymers for these multiple functions. Their surfaces serve as the indispensable primary interfaces between the cell and its surroundings, often mediating or catalyzing important interactions. Prokaryotic Cell Wall Compounds summarizes the current state of knowledge on the prokaryotic cell wall. Topics concerning bacterial and archaeal polymeric cell wall structures, biological activities, growth and inhibition, cell wall interactions and the applications of cell wall components, especially in the field of nanobiotechnology, are presented.

Heterogeneous catalysis provides the backbone of the world's chemical and oil industries. The innate complexity of practical catalytic systems suggests that useful progress should be achievable by investigating key aspects of catalysis by experimental studies on idealised model systems. Thin films and supported clusters are two promising types of model system that can be used for this purpose, since they mimic important aspects of the properties of practical dispersed catalysts. Similarly, appropriate theoretical studies of chemisorption and surface reaction clusters or extended slab systems can provide valuable information on the factors that underlie bonding and catalytic activity. This volume describes such experimental and theoretical approaches to the surface chemistry and catalytic behaviour of metals, metal oxides and metal/metal oxide systems. An introduction to the principles and main themes of heterogeneous catalysis is followed by detailed accounts of the application of modern experimental and theoretical techniques to fundamental problems. The application of advanced experimental methods is complemented by a full description of theoretical procedures, including Hartree-Fock, density functional and similar techniques. The relative merits of the various approaches are considered and directions for future progress are indicated.

This ebook is a selective guide designed to help scholars and students of criminology find reliable sources of information by directing them to the best available scholarly materials in whatever form or format they appear from books, chapters, and journal articles to online archives, electronic data sets, and blogs. Written by a leading international authority on the subject, the ebook provides bibliographic information supported by direct recommendations about which sources to consult and editorial commentary to make it clear how the cited sources are interrelated related. A reader will discover, for instance, the most reliable introductions and overviews to the topic, and the most important publications on various areas of scholarly interest within this topic. In criminology, as in other disciplines, researchers at all levels are drowning in potentially useful scholarly information, and this guide has been created as a tool for cutting through that material to find the exact source you need. This ebook is a static version of an article from Oxford Bibliographies Online: Criminology, a dynamic, continuously updated, online resource designed to provide authoritative guidance through scholarship and other materials relevant to the study and practice of criminology. Oxford Bibliographies Online covers most subject disciplines within the social science and humanities, for more information visit www.aboutobo.com.

Material processing techniques that employ severe plastic deformation have evolved over the past decade, producing metals, alloys and composites having extraordinary properties.

Variants of SPD methods are now capable of creating monolithic materials with submicron and nanocrystalline grain sizes. The resulting novel properties of these materials has led to a growing scientific and commercial interest in them. They offer the promise of bulk nanocrystalline materials for structural; applications, including nanocomposites of lightweight alloys with unprecedented strength. These materials may also enable the use of alternative metal shaping processes, such as high strain rate superplastic forming. Prospective applications for medical, automotive, aerospace and other industries are already under development.

Bacteria are among the earliest forms of life on Earth. Notwithstanding their small size and primitive origin, bacteria still have a tremendous impact on everyday human life. Over the centuries, research into bacteria have provided and enriched the fundamental biological knowledge due to their readily measured processes and effects on higher organisms. Although molecular genetics and microbiology were among the scientific fields that have mostly benefited from the discoveries made in bacteria, our current state of knowledge has gone beyond what anyone could have ever imagined. The present Research Topic aims to cover new and exciting broad aspects of the importance of bacteria to human life, both positive and negative influences. Regulation of bacterial gene expression, replication and segregation control mechanisms, cell to cell communication via quorum sensors, and the relatively recent finding of bacterial immunity via CRISPR, have led to the development of many, and very important new tools in biotechnology and the emerging field of molecular medicine. The battle against infectious diseases has also benefited from the genetic approaches that have been developed in the quest for finding new targets and novel drugs against pathogenic bacteria. At the next level, the human microbiome project has opened up new avenues in understanding the role of bacteria in human health and wellbeing. Finally, the relationship between bacterial infections and human cancers will also be covered, a subject that is still under verification through rigorous experimental approaches. Special emphasis will be given to the bacterial accessory genome, i.e the mobilome, as the primary cause of health-threatening antimicrobial resistance and the production of toxins and virulence factors. Taking into account the evolutionary importance of horizontal gene transfer and the additional beneficial roles of certain bacterial mobile genetic elements, they help project best "the Good, the Bad and the Ugly" outline of this topic. At the time this eBook is about to be published, our Research Topic has registered nearly 55, 000 views.

Get to grips with pandas—a versatile and high-performance Python library for data manipulation, analysis, and discovery Key Features Perform efficient data analysis and manipulation tasks using pandas Apply pandas to different real-world domains using step-by-step demonstrations Get accustomed to using pandas as an effective data exploration tool Book Description Data analysis has become a necessary skill in a variety of positions where knowing how to work with data and extract insights can generate significant value. Hands-On Data Analysis with Pandas will show you how to analyze your data, get started with machine learning, and work effectively with Python libraries often used for data science, such as pandas, NumPy, matplotlib, seaborn, and scikit-learn. Using real-world datasets, you will learn how to use the powerful pandas library to perform data wrangling to reshape, clean, and aggregate your data. Then, you will learn how to conduct exploratory data analysis by calculating summary statistics and visualizing the data to find patterns. In the concluding chapters, you will explore some applications of anomaly detection, regression, clustering, and classification, using scikit-learn, to make predictions based on past data. By the end of this book, you will be equipped with the skills you need to use pandas to ensure the veracity of your data, visualize it for effective decision-making, and reliably reproduce analyses across multiple datasets. What you will learn Understand how data analysts and scientists gather and analyze data Perform data analysis and data wrangling in Python Combine, group, and

aggregate data from multiple sources Create data visualizations with pandas, matplotlib, and seaborn Apply machine learning (ML) algorithms to identify patterns and make predictions Use Python data science libraries to analyze real-world datasets Use pandas to solve common data representation and analysis problems Build Python scripts, modules, and packages for reusable analysis code Who this book is for This book is for data analysts, data science beginners, and Python developers who want to explore each stage of data analysis and scientific computing using a wide range of datasets. You will also find this book useful if you are a data scientist who is looking to implement pandas in machine learning. Working knowledge of Python programming language will be beneficial.

This series of comprehensive manuals gives the home mechanic an in-depth look at specific areas of auto repair.

This new definitive volume on fish auditory systems will interest investigators in both basic research of fish bioacoustics as well as investigators in applied aspects of fisheries and resource management. Topics cover structure, physiology, localization, and acoustic behavior as well as more applied topics such as using sound to detect and locate fish.

A guide to the effective catalysts and latest advances in CO2 conversion in chemicals and fuels Carbon dioxide hydrogenation is one of the most promising and economic techniques to utilize CO2 emissions to produce value-added chemicals. With contributions from an international team of experts on the topic, CO2 Hydrogenation Catalysis offers a comprehensive review of the most recent developments in the catalytic hydrogenation of carbon dioxide to formic acid/formate, methanol, methane, and C2+ products. The book explores the electroreduction of carbon dioxide and contains an overview on hydrogen production from formic acid and methanol. With a practical review of the advances and challenges in future CO2 hydrogenation research, the book provides an important guide for researchers in academia and industry working in the field of catalysis, organometallic chemistry, green and sustainable chemistry, as well as energy conversion and storage. This important book: Offers a unique review of effective catalysts and the latest advances in CO2 conversion Explores how to utilize CO2 emissions to produce value-added chemicals and fuels such as methanol, olefins, gasoline, aromatics Includes the latest research in homogeneous and heterogeneous catalysis as well as electrocatalysis Highlights advances and challenges for future investigation Written for chemists, catalytic chemists, electrochemists, chemists in industry, and chemical engineers, CO2 Hydrogenation Catalysis offers a comprehensive resource to understanding how CO2 emissions can create value-added chemicals.

About 1900 abstracts of monographs and articles. Some foreign literature is included. Entries are arranged alphabetically by authors under topics. Author, title, subject, and geographic location indexes.

This book contains contributions presented at the Active Flow Control 2006 conference, held September 2006, at the Technische Universität Berlin, Germany. It contains a well balanced combination of theoretical and experimental state-of-the-art results of Active Flow Control. Coverage combines new developments in actuator technology, sensing, robust and optimal open- and closed-loop control and model reduction for control.

This volume provides a comprehensive overview on the chemical thermodynamics of those elements that are of particular importance in the safety assessment of radioactive waste disposal systems. This is the first volume in a series of critical reviews to be published on this subject. The book provides an extensive compilation of chemical

thermodynamic data for uranium. A description of procedures for activity corrections and uncertainty estimates is given. A critical discussion of data needed for nuclear waste management assessments, including areas where significant gaps of knowledge exist is presented. A detailed inventory of chemical thermodynamic data for inorganic compounds and complexes of uranium is listed. Data and their uncertainty limits are recommended for 74 aqueous complexes and 199 solid and 31 gaseous compounds containing uranium, and on 52 aqueous and 17 solid auxiliary species containing no uranium. The data are internally consistent and compatible with the CODATA Key Values. The book contains a detailed discussion of procedures used for activity factor corrections in aqueous solution, as well as including methods for making uncertainty estimates.

With a history that reaches back some 90 years, the Hume-Rothery rules were developed to provide guiding principles in the search for new alloys. Ultimately, the rules bridged metallurgy, crystallography, and physics in a way that led to the emergence of a physics of the solid state in 1930s, although the physical implications of the rules were never fully resolved. Even today, despite a revived interest brought about by the 1984 discovery of quasicrystals, much about the rules remains an enigma. Now almost a century after the rules were put forward, Hume-Rothery Rules for Structurally Complex Alloy Phases provides researchers with an insightful and applicable interpretation of the Hume-Rothery electron concentration rule. Invoking first-principle band calculations, the book emphasizes the stability of structurally complex metallic alloys (CMAs).Written by Uichiro Mizutani, long considered the most knowledgeable expert on both the history and science of Hume-Rothery, this seminal work — Offers a unified interpretation of phase stabilization mechanism of CMAs in different classes Explains how to determine the effective valency of transition metal elements Details establishment of d-states-mediated-FsBz interactions in strongly orbital-hybridizing systems Covers the contrast between e/a and VEC, two notions of electron concentration parameters and includes a way to differentiate between them in designing new alloys Explores strengths and shortcomings for the theory on alloy phase stability Discusses the latest take on electron concentration for gamma-brass This work summarizes the ongoing history of Hume-Rothery and reflects the theoretical studies that Professor Mizutani embarked upon to gain deeper understanding of the basic physics behind stabilizing effects related to electron concentration. It describes how metallic and covalent bonding styles can be harmonized to stabilize a given phase in relation to electron concentration and electrochemical effect as defined by the rules. Beyond theory, the approaches presented in these pages will prove of great value to researchers developing new functional metals and alloys.

This book addresses basic and applied aspects of two nexus points of microorganisms in agro-ecosystems, namely their functional role as bio-fertilizers and bio-pesticides. Readers will find detailed information on all of the aspects that are required to make a microbe "agriculturally beneficial." A healthy, balanced soil ecosystem provides a habitat for crops to grow without the need for interventions such as agro-chemicals. No organism in an agro-ecosystem can flourish individually, which is why research on the interaction of microorganisms with higher forms of life has increasingly gained momentum in the last 10-15 years. In fact, most of plants' life processes only become possible through interactions with microorganisms. Using these "little helpers" as a

biological alternative to agro-chemicals is a highly contemporary field of research. The information presented here is based on the authors' extensive experience in the subject area, gathered in the course of their careers in the field of agricultural microbiology. The book offers a valuable resource for all readers who are actively involved in research on agriculturally beneficial microorganisms. In addition, it will help prepare readers for the future challenges that climate change will pose for agriculture and will help to bridge the current gaps between different scientific communities. Whole Person Librarianship guides librarians through the practical process of facilitating connections among libraries, social workers, and social services; explains why those connections are important; and puts them in the context of a national movement. • Gain multiple examples of library-social work collaboration to apply in your own library • Learn to articulate reasons librarians benefit from collaboration with social workers and vice versa • Know where to seek partnerships and how to start them • Develop a vision for how collaborations fit into the ideals of both professions and represent the future of librarianship

Optoelectronics Materials and Devices follows the Optoelectronics Books II and III published in 2011 and 2013, as part of the InTech collection of international works on optoelectronics. Accordingly, as with the first two books of the collection, this book covers recent achievements by specialists around the world. The growing number of countries participating in this endeavor as well as joint participation of the US and Moldova scientists in this edition testifies to the unifying effect of science. An interested reader will find in the book the description of properties and applications employing organic and inorganic materials, as well as the methods of fabrication and analysis of operation and regions of application of modern optoelectronic devices.

This book presents these important facts: a) The mechanism of anionic polymerization, a more than 50-year challenge in polymer chemistry, has now become better understood; b) Precise synthesis of many polymers with novel architectures (triblock, multi-block, graft, exact graft, comb, cyclic, many armed stars with multi-components, dendrimer-like hyper-branched, and their structural mixed (co)polymers, etc.) have been advanced significantly; c) Based on such polymers, new morphological and self-organizing nano-objects and supra molecular assemblies have been created and widely studied and are considered nanodevices in the fields of nano science and technology; d) New high-tech and industrial applications for polymeric materials synthesized by anionic polymerization have been proposed. These remarkable developments have taken place in the last 15 years. Anionic polymerization continues to be the only truly living polymerization system (100 % termination free under appropriate conditions) and consequently the only one with unique capabilities in the synthesis of well-defined (i.e., precisely controlled molecular weight, nearly mono-disperse molecular weight distribution, structural and compositional homogeneity) complex macromolecular architectures. This book, with contributions from the world's leading specialists, will be useful for all researchers, including students, working in universities, in research organizations, and in industry.

Build, Manage and Improve your infrastructure effortlessly. About This Book An up-to-date and comprehensive resource on Terraform that lets you quickly and efficiently launch your infrastructure Learn how to implement your infrastructure as code and make secure, effective changes to your infrastructure Learn to build multi-cloud fault-

tolerant systems and simplify the management and orchestration of even the largest scale and most complex cloud infrastructures Who This Book Is For This book is for developers and operators who already have some exposure to working with infrastructure but want to improve their workflow and introduce infrastructure as a code practice. Knowledge of essential Amazon Web Services components (EC2, VPC, IAM) would help contextualize the examples provided. Basic understanding of Jenkins and Shell scripts will be helpful for the chapters on the production usage of Terraform. What You Will Learn Understand what Infrastructure as Code (IaC) means and why it matters Install, configure, and deploy Terraform Take full control of your infrastructure in the form of code Manage complete infrastructure, starting with a single server and scaling beyond any limits Discover a great set of production-ready practices to manage infrastructure Set up CI/CD pipelines to test and deliver Terraform stacks Construct templates to simplify more complex provisioning tasks In Detail Terraform is a tool used to efficiently build, configure, and improve the production infrastructure. It can manage the existing infrastructure as well as create custom in-house solutions. This book shows you when and how to implement infrastructure as a code practices with Terraform. It covers everything necessary to set up the complete management of infrastructure with Terraform, starting with the basics of using providers and resources. It is a comprehensive guide that begins with very small infrastructure templates and takes you all the way to managing complex systems, all using concrete examples that evolve over the course of the book. The book ends with the complete workflow of managing a production infrastructure as code—this is achieved with the help of version control and continuous integration. The readers will also learn how to combine multiple providers in a single template and manage different code bases with many complex modules. It focuses on how to set up continuous integration for the infrastructure code. The readers will be able to use Terraform to build, change, and combine infrastructure safely and efficiently. Style and approach This book will help and guide you to implement Terraform in your infrastructure. The readers will start by working on very small infrastructure templates and then slowly move on to manage complex systems, all by using concrete examples that will evolve during the course of the book.

This book constitutes the refereed proceedings of the 5th International Workshop on Experimental and Efficient Algorithms, WEA 2006, held in Menorca, Spain, May 2006. The book presents 26 revised full papers together with 3 invited talks. The application areas addressed include most fields applying advanced algorithmic techniques, such as combinatorial optimization, approximation, graph theory, discrete mathematics, scheduling, searching, sorting, string matching, coding, networking, and more.

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