1201 Gpb Chemistry Note Taking Guide Answers

This reference on current VB theory and applications presents a practical system that can be applied to a variety of chemical problems in a uniform manner. After explaining basic VB theory, it discusses VB applications to bonding problems, aromaticity and antiaromaticity, the dioxygen molecule, polyradicals, excited states, organic reactions, inorganic/organometallic reactions, photochemical reactions, and catalytic reactions. With a guide for performing VB calculations, exercises and answers, and numerous solved problems, this is the premier reference for practitioners and upper-level students.

This text details the plant-assisted remediation method, “phytoremediation”, which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil contaminated with high levels of metals, pesticides, solvents, radionuclides, explosives, crude oil, organic compounds and various other contaminants. Many chapters highlight and compare the efficiency and economic advantages of phytoremediation to currently practiced soil and water treatment practices. Volume 5 of Phytoremediation: Management of Environmental Contaminants provides the capstone of the series. Taken together, the five volumes provide a broad–based global synopsis of the current applications of phytoremediation using plants and the microbial communities associated with their roots to decontaminate terrestrial and aquatic ecosystems.

This third edition provides revised and expanded protocols of consolidated approaches as well as new trends in the field. Chapters guide readers through new approaches to optimize Quantum Dots’ (QD) properties, to evaluate their quantum yields, important features about preparative processes and characterizations of QDs, methods related to QDs for live cell applications, and the versatility of QDs in the bioanalytical and biosensing field. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

Very light, very strong. extremely reliable -aircraft and aerospace engineers are. and have to be. very demanding partners in the materials community. The results of their research and development work is not only crucial for one special area of applications. but can also lead the way to new solutions in many other areas of advanced technology. Springer-Verlag and the undersigned editor are pleased to present in this volume. an overview of the many facets of materials science and technology which have been the objective of intensive and systematic research work during past decades in the laboratories of the German Aerospace Research Establishment. Its contents shows clearly the interrelations between goals defined by the user. fundamentals provided by the scientists and viable solutions developed by the practical engineer. The particular personal touch which has been given to this volume by its authors in dedicating it as a farewell present to Professor Wolfgang Bunk. inspiring sci entist and director of the DLR Intitute of Materials Research for more than 20 years. has obviously given an added value to this important publication. Surely. this truly cooperative endeavour will render a valuable service to a large interna tional community of interested readers. many of them having personal links to the Institute. its director and its staff.

Abstract: This book presents contemporary information on mutagenesis in plants and its applications in plant breeding and research. The topics are classified into sections focusing on the concepts, historical development and genetic basis of plant mutation breeding (chapters 1-6); mutagens and induced mutagenesis (chapters 7-13); mutation induction and mutant development (chapters 14-23); mutation breeding (chapters 24-34); or mutations in functional genomics (chapters 35-41). This book is an essential reference for those who are conducting research on mutagenesis as an approach to improving or modifying a trait, or achieving basic understanding of a pathway for a trait --.

This book provides a comprehensive collection of classic and cutting-edge methodologies as well as bioinformatics and genome-editing approaches that are used to quantify immune mediators and analyze their function and biological activity in cancer cells and tissues. Beginning with a section on the detection of immune mediators in samples, the volume continues with sections covering cytokine bioassays, the expression and regulation of immune mediators in cancer cells, and methods to navigate the enormous datasets created by modern DNA and RNA sequencing and proteomic technology. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and wide-ranging, Immune Mediators in Cancer: Methods and Protocols serves as a valuable resource for biochemists, molecular biologists, cancer biologists, and immunologists, as well as for physician-scientists working in the field of immunology and cancer research.

The Magnesium Technology Symposium, the event on which this collection is based, is one of the largest yearly gatherings of magnesium specialists in the world. Papers represent all aspects of the field, ranging from primary production to applications to recycling. Moreover, papers explore everything from basic research findings to industrialization. Magnesium Technology 2020 covers a broad spectrum of current topics, including alloys and their properties; cast products and processing; wrought products and processing; forming, joining, and machining; corrosion and surface finishing; and structural applications. In addition, there is coverage of new and emerging applications.

This book describes the current state of international grape genomics, with a focus on the latest findings, tools and strategies employed in genome sequencing and analysis, and genetic mapping of important agronomic traits. It also discusses how these are having a direct impact on outcomes for grape breeders and the international grape research community. While V. vinifera is a model species, it is not always appreciated that its cultivation usually requires the use of other Vitis species as rootstocks. The book discusses genetic diversity within the Vitis genus, the available genetic resources for breeding, and the available genomic resources for other Vitis species. Grapes (Vitis vinifera spp. vinifera) have been a source of food and wine since their domestication from their wild progenitor (Vitis vinifera ssp. sylvestris) around 8,000 years ago, and they are now the world’s most valuable horticultural crop. In addition to being economically important, V. vinifera is also a model organism for the study of perennial fruit crops for two reasons: Firstly, its ability to be transformed and micropropagated via somatic embryogenesis, and secondly its relatively small genome size of 500 Mb. The economic importance of grapes made V. vinifera an obvious early candidate for genomic sequencing, and accordingly, two draft genomes were reported in 2007. Remarkably, these were the first genomes of any fruiting crop to be sequenced and only the fourth for flowering plants. Although riddled

with gaps and potentially omitting large regions of repetitive sequences, the two genomes have provided valuable insights into grape genomes. Cited in over 2,000 articles, the genome has served as a reference in more than 3,000 genome-wide transcriptional analyses. Further, recent advances in DNA sequencing and bioinformatics are enabling the assembly of reference-grade genome references for more grape genotypes revealing the exceptional extent of structural variation in the species.

This book reviews the advances and challenges of structure-based drug design in the preclinical drug discovery process, addressing various diseases, including malaria, tuberculosis and cancer. Written by internationally recognized researchers, this edited book discusses how the application of the various in-silico techniques, such as molecular docking, virtual screening, pharmacophore modeling, molecular dynamics simulations, and residue interaction networks offers insights into pharmacologically active novel molecular entities. It presents a clear concept of the molecular mechanism of different drug targets and explores methods to help understand drug resistance. In addition, it includes chapters dedicated to natural-product- derived medicines, combinatorial drug discovery, the CryoEM technique for structure-based drug design and big data in drug discovery. The book offers an invaluable resource for graduate and postgraduate students, as well as for researchers in academic and industrial laboratories working in the areas of chemoinformatics, medicinal and pharmaceutical chemistry and pharmacoinformatics.

This new volume, up to date through Spring 2015, provides a detailed examination of the military forces in Northeast Asia—North and South Korea, China, Russia, Japan, and the United States—setting those forces in the larger geostrategic context.

Immunity and Inflammation in Health and Disease: Emerging Roles of Nutraceuticals and Functional Foods in Immune Support provides a comprehensive description of the various pathways by which our immune system works, the signals that trigger immune response and how foods can be used to contain inflammation and boost immunity. This book addresses the role of dietary nutrients in playing a balancing role between host defense and immune support, focusing on new and novel nutraceuticals and functional foods. The first three sections address the various aspects of activation of the immune system. The fourth section deals with the ramifications of a robust and excessive inflammatory response. The final section is focused on the association between nutrition and immunity and how deficiencies in certain nutrients may affect immunocompetence. The conclusion section collates the earlier chapters and discusses paradigm shifts in the field whereby new futuristic directions are also envisioned. Conceptualizes the key features in natural products which can boost immune function and immune health Explains the intricate mechanistic aspects and balance behind immune health Presents the pathophysiology of several diseases associated with immune system disruption

This book addresses various aspects of the current castor bean research, including genetics, biotechnology, comparative genomics, and more specific topics such as oil metabolism and the ricin toxin. It also presents the whole genome sequencing of the castor bean and its impact on the mining of gene families and future plant breeding. Castor bean (Ricinus communis), an oilseed plant, belongs to the Euphorbiaceae (spurge) family. It is a tropical and subtropical crop valued for the high quality and uniform nature of its oil, which is mostly composed of the uncommon fatty acid ricinoleate. Castor bean oil has important industrial applications for the production of lubricants, cosmetics, medicines, and specialty chemicals, and castor bean has also been proposed as a biodiesel crop that does not pose concerns regarding the “food versus fuel” debate. However, it accumulates the type 2 ribosome-inactivating protein ricin in its seeds, and health concerns posed by ricin’s high toxicity have prevented broader cultivation. Recently, there has been renewed interest in castor bean due to potential biosecurity issues.

This book offers an overview of our current understanding of host defense peptides and their potential for clinical applications as well as some of the obstacles to this. The chapters, written by leading experts in the field, detail the number and diversity of host defense peptides, and discuss the therapeutic potential not only of antibacterial, but also of antifungal, antiviral, plant antimicrobial and anticancer host defense peptides. The authors provide new insights into their mechanisms of action and their immunomodulatory properties, and review recent advances in the design of novel therapeutic molecules. Lastly, their potential to prevent preterm births and Staphylococcus aureus infections is highlighted. The book is of interest to researchers, industry and clinicians alike.

This book is open access under a CC BY 4.0 license. By 2050, human population is expected to reach 9.7 billion. The demand for increased food production needs to be met from ever reducing resources of land, water and other environmental constraints. Rice remains the staple food source for a majority of the global populations, but especially in Asia where ninety percent of rice is grown and consumed. Climate change continues to impose abiotic and biotic stresses that curtail rice quality and yields. Researchers have been challenged to provide innovative solutions to maintain, or even increase, rice production. Amongst them, the ‘green super rice’ breeding strategy has been successful for leading the development and release of multiple abiotic and biotic stress tolerant rice varieties. Recent advances in plant molecular biology and biotechnologies have led to the identification of stress responsive genes and signaling pathways, which open up new paradigms to augment rice productivity. Accordingly, transcription factors, protein kinases and enzymes for generating protective metabolites and proteins all contribute to an intricate network of events that guard and maintain cellular integrity. In addition, various quantitative trait loci associated with elevated stress tolerance have been cloned, resulting in the detection of novel genes for biotic and abiotic stress resistance. Mechanistic understanding of the genetic basis of traits, such as N and P use, is allowing rice researchers to engineer nutrient-efficient rice varieties, which would result in higher yields with lower inputs. Likewise, the research in micronutrients biosynthesis opens doors to genetic engineering of metabolic pathways to enhance micronutrients production. With third generation sequencing techniques on the horizon, exciting progress can be expected to vastly improve molecular markers for gene-trait associations forecast with increasing accuracy. This book emphasizes on the areas of rice science that attempt to overcome the foremost limitations in rice production. Our intention is to highlight research advances in the fields of physiology, molecular breeding and genetics, with a special focus on increasing productivity, improving biotic and abiotic stress tolerance and nutritional quality of rice.

Honey Analysis - New Advances and Challenges discusses advances in honey research. Topics include the physicochemical characteristics of honey from stingless bees, the therapeutic properties of honey, melissopalynological analysis as an indicator of the botanical and geographical origin of honey, and methods for authenticating honey. Written by experts in the field, this book provides readers with an indispensable source of information, assisting them in future investigations of honey and beekeeping.

Comprehensive Overview of Advances in Olfaction The common belief is that human smell perception is much reduced compared with other mammals, so that whatever abilities are

uncovered and investigated in animal research would have little significance for humans. However, new evidence from a variety of sources indicates this traditional view is likely overly simplistic. The Neurobiology of Olfaction provides a thorough analysis of the state-of-the-science in olfactory knowledge and research, reflecting the growing interest in the field. Authors from some of the most respected laboratories in the world explore various aspects of olfaction, including genetics, behavior, olfactory systems, odorant receptors, odor coding, and cortical activity. Until recently, almost all animal research in olfaction was carried out on orthonasal olfaction (inhalation). It is only in recent years, especially in human flavor research, that evidence has begun to be obtained regarding the importance of retronasal olfaction (exhalation). These studies are beginning to demonstrate that retronasal smell plays a large role to play in human behavior. Highlighting common principles among various species – including humans, insects, Xenopus laevis (African frog), and Caenorhabditis elegans (nematodes) – this highly interdisciplinary book contains chapters about the most recent discoveries in odor coding from the olfactory epithelium to cortical centers. It also covers neurogenesis in the olfactory epithelium and olfactory bulb. Each subject-specific chapter is written by a top researcher in the field and provides an extensive list of reviews and original articles for students and scientists interested in further readings.
'Ideal for getting an overview of applied organic chemistry' This bestselling standard, now in its 3rd completely revised English edition, is an excellent source of technological and economic information on the most important precursors and intermediates used in the chemical industry. Right and left columns containing synopsis of the main text and statistical data, and numerous fold-out flow diagrams ensure optimal didactic presentation of complex chemical processes. The translation into eight languages, the four German and three English editions clearly evidence the popularity of this book. '... it is where I look first to get a quick overview of the manufacturing process of a product... Weissermel/Arpe has been serving me for years as an indispensable reference work.' (Berichte der Bunsengesellschaft für Physikalische Chemie) 'Whether student or scientist, theorist or practician - everyboby interested in industrial organic chemistry will appreciate this work.' (farbe + lack) '...it should be ready to hand to every chemist or process engineer envolved directly or indirectly with industrial organic chemistry . It should be in the hand of every higher-graduate student, especially if chemical technology is not part of the study, like in many college universities...' (Tenside-Surfactants-Detergents)
Copepods, or more commonly referred to as the "insects of the sea", have successfully colonised every aquatic environment, equating insects in terms of absolute and relative success. They represent up to 90-97% of the marine zooplankton biomass, but may also be conspicuous in freshwater systems. Copepods are the linchpin of aquatic foodwebs; they prey upon phytoplankton while simultaneously acting as a staple food for higher trophic level organisms, contribute to the vertical fluxes of carbon and sustain recycled production through the excretion of ammonia. Copepods can also signal possible climate change and are indicators of the effects of ocean acidification. They are also used as model animals for ecotoxicological and molecular studies, and might be adopted as control agents of disease vectors.Current studies are rapidly exploring multiple lines of research with an intended purpose to provide an up-to-date snapshot of some hot topics in the study of the distribution, biology and ecology of these ubiquitous crustaceans. The chapters collected in this volume, written by leading scientists in different fields of investigation, focus on a wide range of processes and scales, from global distribution to molecular investigations, witnessing the interest of the scientific community at different levels. These contributions point out the latest developments and case studies on a number of research issues, and will promote discussion and stimulate advances in each field of investigation. The editor is confident that readers will appreciate the contents of each chapter and will find in them inspiring suggestions for their research, or even just to satisfy their curiosity.
This volume presents the views and findings of behaviorally and biologically oriented investigators invited to participate in The University of Iowa's biennial learning and memory symposium. While chapters vary in their scope and depth of coverage, they are all amply referenced so that researchers, teachers, and students can obtain background information appropriate to their respective needs.
A comprehensive reference guide to the successful performance of pediatric autopsies and to the optimal recognition and interpretation of their pathologic findings. The authors cover such major developmental disorders as hydrops, chromosomal defects, and congenital abnormalities, metabolic disorders, and review the major organ systems. Additional chapters address sudden infant death, cytogenetics, the medical and forensic autopsy, special procedures, cultures and infection control, and biological hazards at the autopsy. Numerous standard reference tables, copious illustrations and drawings, and an appendix at the end of each chapter provide a wealth of practical information and bibliographic citations.
Biodiversity observation systems are almost everywhere inadequate to meet local, national and international (treaty) obligations. As a result of alarmingly rapid declines in biodiversity in the modern era, there is a strong, worldwide desire to upgrade our monitoring systems, but little clarity on what is actually needed and how it can be assembled from the elements which are already present. This book intends to provide practical guidance to broadly-defined biodiversity observation networks at all scales, but predominantly the national scale and higher. This is a practical how-to book with substantial policy relevance. It will mostly be used by technical specialists with a responsibility for biodiversity monitoring to establish and refine their systems. It is written at a technical level, but one that is not discipline-bound: it should be intelligible to anyone in the broad field with a tertiary education.
The Art of Drug Synthesis illustrates how chemistry, biology, pharmacokinetics, and a host of other disciplines come together to produce successful medicines. The authors have compiled a collection of 21 representative categories of drugs, from which they have selected as examples many of the best-selling drugs on the market today. An introduction to each drug is provided, as well as background to the biology, pharmacology, pharmacokinetics, and drug metabolism, followed by a detailed account of the drug synthesis. Edited

by prominent scientists working in drug discovery for Pfizer Meets the needs of a growing community of researchers in pharmaceutical R&D Provides a useful guide for practicing pharmaceutical scientists as well as a text for medicinal chemistry students An excellent follow-up to the very successful first book by these editors, Contemporary Drug Synthesis, but with all new therapeutic categories and drugs discussed.

Urbanization, industrialization, and unethical agricultural practices have considerably negative effects on the environment, flora, fauna, and the health and safety of humanity. Over the last decade, green chemistry research has focused on discovering and utilizing safer, more environmentally friendly processes to synthesize products like organic compounds, inorganic compounds, medicines, proteins, enzymes, and food supplements. These green processes exist in other interdisciplinary fields of science and technology, like chemistry, physics, biology, and biotechnology, Still the majority of processes in these fields use and generate toxic raw materials, resulting in techniques and byproducts which damage the environment. Green chemistry principles, alternatively, consider preventing waste generation altogether, the atom economy, using less toxic raw materials and solvents, and opting for reducing environmentally damaging byproducts through energy efficiency. Green chemistry is, therefore, the most important field relating to the sustainable development of resources without harmfully impacting the environment. This book provides in-depth research on the use of green chemistry principles for a number of applications.

Following Contemporary Drug Synthesis and The Art of Drug Synthesis (Wiley, 2004 and 2007), two well-received works, is this new book that demystifies the process of modern drug discovery for practitioners and students. An enhanced introduction covers areas such as background, pharmacology, SAR, PK/PD, efficacy, and safety. Focusing on the advantages of process synthesis versus the discovery synthetic route, Modern Drug Synthesis features authoritative coverage by distinguished editors and authors (some chapter authors are the actual inventor of the drug) of twenty different drug molecules.

Precision Medicine: Tools and Quantitative Approaches discusses precision and personalized medicine, two relevant topics that are revolutionizing diagnostics and treatment, while also providing a shift toward prevention. The book covers the most relevant features and explanations underlying developments in the field. A timely review on prerequisites, causes and consequences is given. Unique to this book is a combined view on technical and data analysis aspects that is mandatory for obtaining and interpreting results. This book is a valuable source for researchers in medical and life sciences, physicians and students with an interest in this emerging field of precision medicine. Provides technological aspects in precision medicine with aspects of modern statistical and bioinformatics models and methods Brings timely reviews on status and chances in precision medicine and associated aspects of data analysis, statistics and data interpretation Encompasses easy access to relevant approaches, interactions and original literature

Development of superior crops that have consistent performance in quality and in quantity has not received the same emphasis in the field of genetics and breeding as merited. Specialty trait requires special focus to propagate. Yet basic germplasm and breeding methodologies optimized to improve crops are often applied in the development of improved specialty types. However, because of the standards required for specialty traits, methods of development and improvement are usually more complex than those for common commodity crops. The same standards of performance are desired, but the genetics of the specialty traits often impose breeding criteria distinct from those of non-specialty possessing crops. Specifically, quality improvement programs have unique characteristics that require careful handling and monitoring during their development for specific needs. Adding value either via alternative products from the large volumes of grain produced or development of specialty types is of interest to producers and processors. This work assimilates the most topical results about quality improvement with contemporary plant breeding approaches.The objective of this book is to provide a summary of the germplasm, methods of development, and specific problems involved for quality breeding. In total, fourteen chapters, written by leading scientists involved in crop improvement research, provide comprehensive coverage of the major factors impacting specialty crop improvement.

This book is a comprehensive overview of the clinical and scientific aspects of Autism from the leading experts in the field. The clinical section covers everything from epidemiological features to epigenetic regulation to behavioral therapies and much in between. The basic science section presents the latest knowledge on the underlying causes of the disorder including the role of various neurotransmitters, neurexins and neuroligins, reelin, and other proteins. Chapters also explore the cognition and motor control in autism and the connection between oxidative stress and mitochondrial dysfunction and autism. The thorough description of these underlying causes may help researchers and clinicians find more effective treatments and therapies for the 1 in 68 American children who have been diagnosed with Autism.

This encyclopedia, written by authoritative experts under the guidance of an international panel of key researchers from academia, national laboratories, and industry, is a comprehensive reference covering all major aspects of metallurgical science and engineering of aluminum and its alloys. Topics covered include extractive metallurgy, powder metallurgy (including processing), physical metallurgy, production engineering, corrosion engineering, thermal processing (processes such as metalworking and welding, heat treatment, rolling, casting, hot and cold forming), surface engineering and structure such as crystallography and metallography.

Volume 18 of Reviews in Mineralogy provides a general introduction to the use of spectroscopic techniques in Earth Sciences. It gives an Introduction To Spectroscopic Methods and covers Symmetry, Group Theory And Quantum Mechanics; Spectrum-Fitting Methods; Infrared And Raman Spectroscopy; Inelastic Neutron Scattering; Vibrational Spectroscopy Of Hydrous Components; Optical Spectroscopy; Mossbauer Spectroscopy; MAS NMR Spectroscopy Of Minerals And Glasses; NMR Spectroscopy And Dynamic Processes In Mineralogy And Geochemistry; X-Ray Absorption Spectroscopy: Applications In Mineralogy ind Geochemistry; Electron Paramagnetic Resonance; Auger Electron

And X-Ray Photelectron Spectroscopies and Luminescence, X-Ray Emission and New Spectroscopies. The authors of this volume presented a short course, entitled "Spectroscopic Methods in Mineralogy and Geology", May 13-15, 1988, in Hunt Valley, Maryland.

Dietary Interventions in Liver Disease: Foods, Nutrients, and Dietary Supplements provides valuable insights into the agents that affect metabolism and other health-related conditions in the liver. It provides nutritional treatment options for those suffering from liver disease. Information is presented on a variety of foods, including herbs, fruits, soy and olive oil, thus illustrating that variations in intake can change antioxidant and disease preventing non-nutrients that affect liver health and/or disease promotion. This book is a valuable resource for biomedical researchers who focus on identifying the causes of liver diseases and food scientists targeting health-related product development. Provides information on agents that affect metabolism and other health-related conditions in the liver Explores the impact of composition, including differences based on country of origin and processing techniques Addresses the most positive results from dietary interventions using bioactive foods to impact liver disease, including reduction of inflammation and improved function

Since the first attempts at structure-based drug design about four decades ago, molecular modelling techniques for drug design have developed enormously, along with the increasing computational power and structural and biological information of active compounds and potential target molecules. Nowadays, molecular modeling can be considered to be an integral component of the modern drug discovery and development toolbox. Nevertheless, there are still many methodological challenges to be overcome in the application of molecular modeling approaches to drug discovery. The eight original research and five review articles collected in this book provide a snapshot of the state-of-the-art of molecular modeling in drug design, illustrating recent advances and critically discussing important challenges. The topics covered include virtual screening and pharmacophore modelling, chemoinformatic applications of artificial intelligence and machine learning, molecular dynamics simulation and enhanced sampling to investigate contributions of molecular flexibility to drug-receptor interactions, the modeling of drug-receptor solvation, hydrogen bonding and polarization, and drug design against protein-protein interfaces and membrane protein receptors.

Fruit Breeding is the eighth volume in the Handbook of Plant Breeding series. Like the other volumes in the series, this volume presents information on the latest scientific information in applied plant breeding using the current advances in the field, from an efficient use of genetic resources to the impact of biotechnology in plant breeding. The majority of the volume showcases individual crops, complemented by sections dealing with important aspects of fruit breeding as trends, marketing and protection of new varieties, health benefits of fruits and new crops in the horizon. The book also features contributions from outstanding scientists for each crop species. Maria Luisa Badenes Instituto Valenciano de Investigaciones Agrarias (IVIA), Valencia, Spain David Byrne Department of Horticultural Sciences, Texas A&M University, College Station, TX, USA

Over the last decade, scientific and engineering interests have been shifting from conventional ion mobility spectrometry (IMS) to field asymmetric waveform ion mobility spectrometry (FAIMS). Differential Ion Mobility Spectrometry: Nonlinear Ion Transport and Fundamentals of FAIMS explores this new analytical technology that separates and characterizes ions by the difference between their mobility in gases at high and low electric fields. It also covers the novel topics of higher-order differential IMS and IMS with alignment of dipole direction. The book relates the fundamentals of FAIMS and other nonlinear IMS methods to the physics of gas-phase ion transport. It begins with the basics of ion diffusion and mobility in gases, covering the main attributes of conventional IMS that are relevant to all IMS approaches. Building on this foundation, the author reviews diverse high-field transport phenomena that underlie differential IMS. He discusses the conceptual implementation and first-principles optimization of FAIMS as a filtering technique, emphasizing the dependence of FAIMS performance metrics on instrumental parameters and properties of ion species. He also explores ion reactions in FAIMS caused by field heating and the effects of inhomogeneous electric field in curved FAIMS gaps. Written by an accomplished scientist in the field, this state-of-the-art book supplies the foundation to understand the new technology of nonlinear IMS methods.

Edward Teller is perhaps best known for his belief in freedom through strong defense. But this extraordinary memoir at last reveals the man behind the headlines--passionate and humorous, devoted and loyal. Never before has Teller told his story as fully as he does here. We learn his true position on everything from the bombing of Japan to the pursuit of weapons research in the post-war years. In clear and compelling prose, Teller chronicles the people and events that shaped him as a scientist, beginning with his early love of music and math, and continuing with his study of quantum physics under Werner Heisenberg. He also describes his relationships with some of the century's greatest minds--Einstein, Bohr, Fermi, Szilard, von Neumann--and offers an honest assessment of the development of the atomic and hydrogen bombs, the founding of Lawrence Livermore Laboratory, and his complicated relationship with J. Robert Oppenheimer.Rich and humanizing, this candid memoir describes the events that led Edward Teller to be honored or abhorred, and provides a fascinating perspective on the ability of a single individual to affect the course of history.

Featuring over 1,500 mammographic images, this atlas is a comprehensive guide to interpreting mammograms. It presents the full spectrum of manifestations of breast diseases, as well as cases involving the postsurgical and augmented breast. Chapters are organized according to the pattern seen on the mammogram to develop readers' pattern recognition skills and to allow quick and complete definition of etiologies and clinical implications for a particular finding. This edition includes new chapters on the augmented breast, the role of ultrasound and MRI in breast imaging, and imaging-guided breast interventions. The terminology of the BI-RADS® lexicon is used throughout.

Global warming is accelerating faster than the ability for natural repair, and environmental stresses are damaging ecosystems, all affecting physical and biological systems on Earth. A new Nasa-led study shows that human activity has caused climate changes resulting in permafrost thawing, acid rain, and lower productivity in lakes as well as increased emissions of greenhouse gases, including CO2, N20, CH4, CF3, and CFC. Marine plants play a vital role in maintaining the balance of marine environments, while serving as a source of food for humankind and important chemical compounds. Microalgae and seaweed have enormous potential for reducing global warming and climate change. During photosynthesis algae grow, draw CO2 from the atmosphere, release oxygen, and produce solar biofuel. Experts in the life of marine plant ecosystems in globally changing environments contributed chapters to this book. The target readers are phycologists, ecologists, atmospheric scholars, conservationists, environmentalists, and ecologically aware laymen.