

P Bhattacharyya S Neogi K S Roy And K S Rao

This compilation has been designed to provide a comprehensive source of theoretical and practical update for scientists working in the broad field of soil science. The book explores all possible mechanisms and means to improve nutrient use efficiencies involving developing and testing of nanofertilizers, developing consortia based microbial formulations for mobilization of soil nutrients, and engineering of nutrient efficient crops using molecular biology and biotechnological tools. This is an all-inclusive collection of information about soil science. This book is of interest to teachers, researchers, soil scientists, capacity builders and policymakers. Also the book serves as additional reading material for undergraduate and graduate students of soil science, quantitative ecology, earth sciences, GIS and geodetic sciences, as well as geologists, geomorphologists, hydrologists and landscape ecology. National and international agriculture and soil scientists, policy makers will also find this to be a useful read.

The Indian Nitrogen Assessment: Sources of Reactive Nitrogen, Environmental and Climate Effects, and Management Options and Policies provides a reference for anyone interested in Reactive N, from researchers and students, to environmental managers. Although the main processes that affect the N cycle are well known, this

book is focused on the causes and effects of disruption in the N cycle, specifically in India. The book helps readers gain a precise understanding of the scale of nitrogen use, misuse, and release through various agricultural, industrial, vehicular, and other activities, also including discussions on its contribution to the pollution of water and air. Drawing upon the collective work of the Indian Nitrogen Group, this reference book helps solve the challenges associated with providing reliable estimates of nitrogen transfers within different ecosystems, also presenting the next steps that should be taken in the development of balanced, cost-effective, and feasible strategies to reduce the amount of reactive nitrogen. Identifies all significant sources of reactive nitrogen flows and their contribution to the nitrogen-cycle on a national, regional, and global level Covers nitrogen management across sectors, including the environment, food security, energy, and health Provides a single reference on reactive nitrogen in India to help in a number of activities, including the evaluation, analysis, synthesis, documentation, and communications on reactive nitrogen

New and Improved Global Edition: Three-Volume Set A ready reference addressing a multitude of soil and soil management concerns, the highly anticipated and widely expanded third edition of Encyclopedia of Soil Science now spans three volumes and covers ground on a global scale. A definitive guide designed for both

coursework and self-study, this latest version describes every branch of soil science and delves into trans-disciplinary issues that focus on inter-connectivity or the nexus approach. For Soil Scientists, Crop Scientists, Plant Scientists and More A host of contributors from around the world weigh in on underlying themes relevant to natural and agricultural ecosystems. Factoring in a rapidly changing climate and a vastly growing population, they sound off on topics that include soil degradation, climate change, soil carbon sequestration, food and nutritional security, hidden hunger, water quality, non-point source pollution, micronutrients, and elemental transformations. New in the Third Edition: Contains over 600 entries Offers global geographical and thematic coverage Entries peer reviewed by subject experts Addresses current issues of global significance Encyclopedia of Soil Science, Third Edition: Three Volume Set expertly explains the science of soil and describes the material in terms that are easily accessible to researchers, students, academicians, policy makers, and laymen alike. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel)

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Plants are typically colonized by numerous endophyte species symbiotically without any noticeable disease symptoms. These microbes are abundant, diverse and play critical ecological roles across natural and agricultural ecosystems. Endophytes have attracted the attention of researchers due to their various beneficial effects on plants, especially in agricultural crop species. Genomic tools will enhance our understanding on the growth and nutrition requirements of this host-symbiont relationship. Recent advances in DNA sequencing technologies and bioinformatic pipelines have allowed analyzing the plant microbiome and host-endophyte interaction more effectively with limited bias. Furthermore, various studies have employed and utilized transcriptomic and genomic tools to understand the role of endophytes and their interaction with plant hosts. This electronic book covers various research articles highlighting the important developments on endophytes using transcriptomics, next generation sequencing and genomic tools.

Soil Analysis: Recent Trends and Applications

No-till Farming Systems for Sustainable Agriculture

The Indian Nitrogen Assessment

Challenges and Opportunities

Report [of The] ST. John Ambulance Association and the St. John Ambulance Brigade (India)

Global climate change is one of the most serious threats to the environment of the earth and to the crop production. Crop 's vulnerability to climate change stress caused by the greenhouse gases emission is a serious concern. This book describes various technologies and methods including the simulation of the future climate changes, studying the response of crop plants and characterizing their responses physiologically and biochemically. It includes the latest information of protocols and technologies for climate change research on agriculture. This book is of interest to teachers, researchers, climate change scientists, capacity builders and policymakers. Also the book serves as additional reading material for undergraduate and graduate students of agriculture, forestry, ecology, soil science, and environmental sciences. National and international agricultural scientists, policy makers will also find this to be a useful read.

Computational Science and Engineering contains peer-reviewed research presented at the International Conference on Computational Science and Engineering (RCC Institute of Information Technology, Kolkata, India, 4-6 October 2016). The contributions cover a wide range of topics: - electronic devices - photonics - electromagnetics - soft computing - artificial intelligence - modern communication systems Focussing on strong theoretical and methodological approaches and applications, Computational Science and Engineering will be of interest to academia and professionals involved or interested in the above mentioned domains.

Read Book P Bhattacharyya S Neogi K S Roy And K S Rao

This book presents the dispersion relation in heavily doped nano-structures. The materials considered are III-V, II-VI, IV-VI, GaP, Ge, Platinum Antimonide, stressed, GaSb, Te, II-V, HgTe/CdTe superlattices and Bismuth Telluride semiconductors. The dispersion relation is discussed under magnetic quantization and on the basis of carrier energy spectra. The influences of magnetic field, magneto inversion, and magneto nipi structures on nano-structures is analyzed. The band structure of optoelectronic materials changes with photo-excitation in a fundamental way according to newly formulated electron dispersion laws. They control the quantum effect in optoelectronic devices in the presence of light. The measurement of band gaps in optoelectronic materials in the presence of external photo-excitation is displayed. The influences of magnetic quantization, crossed electric and quantizing fields, intense electric fields on the on the dispersion relation in heavily doped semiconductors and super-lattices are also discussed. This book contains 200 open research problems which form the integral part of the text and are useful for graduate students and researchers. The book is written for post graduate students, researchers and engineers.

The Proterozoic aeon involved at least three major continental readjustments. India and Antarctica appear in most models of supercontinent reconstructions, but their relative position has been the subject of debate. High-resolution petrological and geochronological data, especially from the Proterozoic mobile belts, provide the principal means of resolving this issue. The ice-covered nature of Antarctica allows only limited access to the rocks, and then only in coastal tracts, so detailed studies in more accessible Proterozoic terrains in India assume added significance. This volume, a follow-up to the XII International Symposium on Antarctic Earth Science, Goa (a SCAR symposium), provides new data from selected locations

in east Antarctica (Enderby Land and Dronning Maud Land) and from India, including the Eastern Ghats Mobile Belt (EGMB), Chota Nagpur Gneissic Complex, the Khasi Hills and the Aravalli-Delhi Mobile Belt. The presented geochronological data, constrained by petrological studies, are expected to provide new insights, especially into the EGMB-east Antarctica connection and the rate of continental readjustments in the post-Rodinia break-up.

Encyclopedia of Soil Science

Effects of Nanostructured Materials

Volume 2: Quantization and Entropy

Biomass, Biofuels, Biochemicals

Soil Management for Sustainable Agriculture

Taking a sustainable approach, this volume explores the various soil management techniques. It begins with an overview of the elementary concepts of soil management and then delves into new research and novel soil management tools and techniques. Topics include:

- Clays as a critical component in sustainable agriculture with respect to carbon sequestration in conjunction with its interaction with soil enzymes*
- The potential utilization of microbes to mitigate crop stress*
- Resource conservation technologies and prospective carbon management strategies*
- The use of smart tools for monitoring soils*
- Effective nutrient management approaches*
- Nanotechnological*

interventions for soil management • Techniques for the remediation of soils contaminated by metals and pesticides
This book covers the contemporary environmental issues faced by life on the planet and the role planetary microbiomes play in such issues. Providing insights on the net favorable and adverse effect of microbial processes, this volume covers both the spontaneous and anthropocentric events that impact climate change and life on the planet. The book describes the ecological significance of microbiomes associated with the kingdoms Plantae and Animalia with respect to climate change, natural and anthropogenic causes of climate change, microbial interactions in nature, planetary microbiomes and food security, climate change in relation to disease epidemiology and human health and engineering microorganisms to mitigate the consequences of climate change. The individual chapters in the intended book provide both theoretical and practical exposure to the current issues and future challenges of climate change in relation to the microbiomes. This collection should serve as ready reference to the researchers working in the area to reshape their future research in addressing the challenges of global climate change.

The book brings out an encyclopaedic picture of the potential areas of transformative Indian agriculture through innovations in science, technology, institutional and policy affairs directed in building a self-reliant India (Atmanirbhar Bharat). The book has addressed the challenges to make India free from hunger, poverty and undernutrition, and suggested interventions with focus on all-inclusiveness and sustainability, peace and prosperity, and resilience to climate and other volatilities. Most of these propositions are analogous to the Sustainable Development Goals - Agenda 2030, which India has committed to achieve. The book especially covers critical needs for development on different fragile ecosystems such as coastal, desert, hill, ravine and other marginal ecosystems. The book will act as very useful guidance for the policy makers, and development communities, and a reference document to academicians as well. Note: T&F does not sell or distribute the hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka. This title is co-published with NIPA. This monograph investigates the entropy in heavily doped (HD) quantized structures by analyzing under the influence of

magnetic quantization, crossed electric and quantizing fields the range from HD quantum confined nonlinear optical materials to HgTe/CdTe HD superlattices with graded interfaces. Finally the authors address various challenges in today's research of optoelectronic materials and give an outlook to future studies.

Computational Science and Engineering

Green Innovation, Sustainable Development, and Circular Economy

Conservation Agriculture

Climate Change Mitigation: Sequestration of Green House Gases

Conservation Agriculture For Carbon Sequestration And Sustaining Soil Health

This book collects all the latest technologies with their implications on the global rice cultivation. It discusses all aspects of rice production and puts together the latest trends and best practices in the rice production. Rice is produced and consumed worldwide and especially an important crop for Asia. It is a staple food in majority of population living is this continent which distinguishes this from rest of the world. Climatic fluctuations, elevated concentrations of carbon dioxide, enhanced temperature have created extreme weather conditions for rice cultivation. Also, increasing pest attacks make situation complicated for the

farmers. Therefore, rice production technology also has to be adjusted accordingly. This book is of interest to teachers, researchers, plant biotechnologists, pathologists, agronomists, soil scientists, food technologists from different part of the globe. Also, the book serves as additional reading material for students of agriculture, soil science, and environmental sciences. National and international agricultural scientists, policy makers will also find this to be a useful read

Soil analysis is critically important in the management of soil-based production systems. In the absence of efficient methods of soil analysis our understanding of soil is pure guesswork. Ideally the pro-active use of laboratory analysis leads to more sustainable soil productivity. Unfortunately, most of the world's agriculture is still reactionary, waiting for obvious yield declines to occur before taking action to identify the reasons. The modern soil laboratory is pivotal to informing soil managers what adaptive practices are needed to address chemical and physical imbalances before they occur, and the intelligent adaptive use of laboratory data not only greatly speeds up and reduces the cost of empirical soil study, but can even render it unnecessary. This book provides a synopsis of the analytical procedures used for soil analysis, discussing the common physical, chemical and biological analytical methods used in agriculture and horticulture. Written by

experienced experts from institutions and laboratories around the globe, it provides insights for a range of users, including those with limited laboratory facilities, and helps students, teachers, soil scientists and laboratory technicians increase their knowledge and skills and select appropriate methods for soil analysis.

Biomass, Biochemicals, Biofuel: Climate Change Mitigation: Sequestration of Green House Gases is designed to not only give basic knowledge on the topics presented, but also to enlighten on conventional and advanced technologies, socioeconomic aspects, techno-economic feasibility, models and modeling tools, and detailed LCA approaches in the sequestration of GHGs for biofuel and biomaterials, including biopolymer production. These innovative technologies and novel prospective directly find applications in day-to-day practices. The book is a useful guide to politicians, researchers, teachers and waste management practitioners. It offers a treasure of knowledge to guide readers on the importance of GHGs sequestration in important areas. The issue of climate change is gaining much more attention by researchers, public, politicians and others. Climate change is one of the most complex issues the world is facing today. It has implications across society, including in science, technology, economics, society, politics, and moral and ethical dilemmas. Introduces

appropriate technologies for GHG sequestration for biofuel and biomaterials production Presents the best available technologies for climate mitigation and examples from various geographical areas Evaluates technological systems to help users develop technically best and economically feasible projects Offers chemical looping mechanisms for the sequestration of green house gases for biofuel and biomaterials

Climate change is an issue that has been generating a significant amount of discussion, research, and debate in recent years. Climate change continues to evolve at a rapid rate and continues to have a wide array of effects on everything from temperature to plant life. Beyond the negative environmental impacts, climate change is also proving to be a detriment to society with increasingly violent natural disasters and human health effects. It is essential to stay up to date on the latest in emerging research within this field as it continues to develop. The Research Anthology on Environmental and Societal Impacts of Climate Change discusses the varied effects of climate change throughout all areas of life and provides a comprehensive dive into the latest research on key elements of society that are affected by the rapidly increasing climate. Covering a range of topics including reproduction, plants and animals, and energy demand, it is ideal for environmentalists, policymakers, environmental engineers, scientists, disaster

and crisis management personnel, professionals, government officials, practitioners, upper-level students, and academics interested in emerging research on the numerous impacts of climate change.

Crustal Evolution of India and Antarctica

Nanomaterials

Nanobiotechnology for Safe Bioactive Nanobiomaterials

Soil Science: Fundamentals to Recent Advances

Advances in Crop Environment Interaction

This book comprises 41 s dealing various issues, prospects and importance of conservation agriculture practices followed across different regions with special emphasis on rainfed regions. We hope this book on conservation agriculture will be highly useful to researchers, scientists, students, farmers and land managers for efficient and sustainable management of natural resources.

Although green innovation and technology is not new, so far very limited information is available regarding the diversified approaches for green technologies and engineering. This book highlights the challenges and opportunities, offering a roadmap for using various approaches in the most cost effective way. The book discusses the interrelationship between a circular economy and green technologies. It presents the dimensions of green

innovations and illustrates the challenges of industrialization, especially in terms of material synthesis and utilized processes. It covers the current environmental and health challenges of societies and describes the role of stakeholders in developing sustainable societies and industries. This book provides a line of approach to core and interdisciplinary students, academicians, research scientists, and various industry personnel to present their ideas of green innovations with a common vision of sustainable development of community and industries in mind. Features Discusses the interrelationship between a circular economy and green technologies Presents the dimensions of green innovations Illustrates the challenges of industrialization, especially in terms of material synthesis and utilized processes Covers the current environmental and health challenges of societies Offers the identification and role of stakeholders in the sustainable development of societies and industries

This monograph solely investigates the Debye Screening Length (DSL) in semiconductors and their nano-structures. The materials considered are quantized structures of non-linear optical, III-V, II-VI, Ge, Te, Platinum Antimonide, stressed materials, Bismuth, GaP, Gallium Antimonide, II-V and Bismuth Telluride respectively. The DSL in opto-electronic materials and their quantum confined counterparts is studied in the presence of strong light waves and intense electric fields on the basis of newly formulated electron dispersion

laws that control the studies of such quantum effect devices. The suggestions for the experimental determination of 2D and 3D DSL and the importance of measurement of band gap in optoelectronic materials under intense built-in electric field in nano devices and strong external photo excitation (for measuring photon induced physical properties) have also been discussed in this context. The influence of crossed electric and quantizing magnetic fields on the DSL and the DSL in heavily doped semiconductors and their nanostructures has been investigated. This monograph contains 150 open research problems which form the integral part of the text and are useful for both PhD students and researchers in the fields of solid-state sciences, materials science, nano-science and technology and allied fields in addition to the graduate courses in modern semiconductor nanostructures.

Feeding the increasing global population, which is projected to reach ~10 billion by 2050, there has been increasing demands for more improved/sustainable agricultural management practices that can be followed by farmers to improve productivity without jeopardizing the environment and ecosystem. Indeed, about 95% of our food directly or indirectly comes from soil. It is a precious resource, and sustainable soil management is a critical socio-economic and environmental issue. Maintaining the environmental sustainability while the world is facing resource degradation, increasing climate change and population explosion is the

current challenge of every food production sectors. Thus, there is an urgent need to evolve a holistic approach such as conservation agriculture to sustain higher crop productivity in the country without deteriorating soil health. Conservation Agriculture (CA), is a sustainable approach to manage agro-ecosystems in order to improve productivity, increase farm profitability and food security and also enhance the resource base and environment. Worldwide, it has been reported various benefits and prospects in adopting CA technologies in different agro-climatic conditions. Yet, CA in arid and semi-arid regions of India and parts of south Asia raises uncertainties due to its extreme climates, large scale residue burning, soil erosion and other constraints such as low water holding capacity, high potential evapotranspiration, etc . Thus, the proposed book has 30 chapters addressing all issues relevant to conservation agriculture/no-till farming system. The book also gives further strengthening existing knowledge in relation to soil physical, chemical and biological processes and health within close proximity of CA as well as machinery requirements. Moreover, the information on carbon (C) sequestration, C credits, greenhouse gas (GHG) emission, mitigation of climate change effects and socio-economic view on CA under diverse ecologies namely rainfed, irrigated and hill eco-region is also deliberated. For large scale adoption of CA practices in South Asian region especially in India and other countries need dissemination of best-bet CA technologies for dominant soil types/cropping

systems through participatory mode, strong linkages and institutional mechanism and public-private-policy support. We hope this book gives a comprehensive and clear picture about conservation agriculture/no-till farming and its associated problem, challenges, prospects and benefits. This book shall be highly useful reference material to researchers, scientists, students, farmers and land managers for efficient and sustainable management of natural resources.

A Sustainable Approach for Soil Health and Food Security

Magneto Thermoelectric Power in Heavily Doped Quantized Structures

Dispersion Relations in Heavily-Doped Nanostructures

Technologies for Green House Gas Assessment in Crop Studies

Technical report

Advances in Agronomy continues to be recognized as a leading reference and a first-rate source for the latest research in agronomy. As always, the subjects covered are varied and exemplary of the myriad of subject matter dealt with by this long-running serial. Timely and state-of-the-art reviews Distinguished, well recognized authors A venerable and iconic review series Timely publication of submitted reviews

Advances in Agronomy continues to be recognized as a leading reference and

first-rate source for the latest research in agronomy. Each volume contains an eclectic group of reviews by leading scientists throughout the world. As always, the subjects covered are rich, varied, and exemplary of the abundant subject matter addressed by this long-running serial. Includes numerous, timely, state-of-the-art reviews on the latest advancements in agronomy Features distinguished, well recognized authors from around the world Builds upon this venerable and iconic review series Covers the extensive variety and breadth of subject matter in the crop and soil sciences

Climate change is expected to influence several productive sectors, the most significant of which is agriculture. Agriculture comprises an important sector of the global economy that includes crops, livestock, and seafood. Agriculture, aquaculture, and fisheries are closely linked to the climate, with changes in climatic conditions able to drastically affect animal and plant productivity, which in turn has a direct impact on human well-being. Impacts of Climate Change on Agriculture and Aquaculture is a critical scholarly publication that provides an integrated assessment of climate change impacts on agriculture, aquaculture, and fisheries and explores a set of strategies to secure sustainable food security. While highlighting the associations between climate change, food security, and socio-economic development, the book establishes an inventory of good

agricultural practices for the adaptation to climate change and presents solutions for making agricultural and food systems more sustainable. Featuring a wide range of topics such as carbon sequestration, ecosystem management, and desertification, this book is ideal for agriculturalists, environmentalists, fisheries, marine biologists, ichthyologists, government officials, academicians, policy makers, scientists, professionals, researchers, and students.

This book is a comprehensive summary of current global research on no-till farming, and its benefits and challenges from various agronomic, environmental, social and economic perspectives. It details the characteristics and future requirements of no-till farming systems across different geographic and climatic regions, and outlines what is needed to increase the uptake of no-till farming globally. Over 35 chapters, this book covers in detail the agronomic and soil management issues that must be resolved to ensure the successful implementation of these systems. Important economic, environmental, social and policy considerations are discussed. It also features a series of case studies across a number of regions globally, highlighting the challenges and opportunities for no-till and how these may vary depending on climate and geopolitical location. This book is a remarkable compilation by experts in no-till farming systems. The promotion and expansion of no-till farming systems

worldwide will be critical for food security, and resource and environmental sustainability. This is an invaluable reference for both researchers and practitioners grappling with the challenges of feeding the world's rising population in an environment increasingly impacted by climate change. It is an essential reading for those seeking to understand the complexity of no-till farming systems and how best to optimise these systems in their region.

Modern Techniques of Rice Crop Production

Carbon Management in Tropical and Sub-Tropical Terrestrial Systems

Heavily-Doped 2D-Quantized Structures and the Einstein Relation

Input Use Efficiency for Food and Environmental Security

Research Anthology on Environmental and Societal Impacts of Climate Change

Learn from this integrated approach to the management and restoration of ecosystems edited

by an international leader in the field The Handbook of Ecological and Ecosystem

Engineering delivers a comprehensive overview of the latest research and practical

developments in the rapidly evolving fields of ecological and ecosystem engineering.

Beginning with an introduction to the theory and practice of ecological engineering and

ecosystem services, the book addresses a wide variety of issues central to the restoration and

remediation of ecological environments. The book contains fulsome analyses of the restoration, rehabilitation, conservation, sustainability, reconstruction, remediation, and

reclamation of ecosystems using ecological engineering techniques. Case studies are used to highlight practical applications of the theory discussed within. The material in the Handbook of Ecological and Ecosystem Engineering is particularly relevant at a time when the human population is dramatically rising, and the exploitation of natural resources is putting increasing pressure on planetary ecosystems. The book demonstrates how modern scientific ecology can contribute to the greening of the environment through the inclusion of concrete examples of successful applied management. The book also includes: A thorough discussion of ecological engineering and ecosystem services theory and practice An exploration of ecological and ecosystem engineering economic and environmental revitalization An examination of the role of soil meso and macrofauna indicators for restoration assessment success in a rehabilitated mine site A treatment of the mitigation of urban environmental issues by applying ecological and ecosystem engineering A discussion of soil fertility restoration theory and practice Perfect for academic researchers, industry scientists, and environmental engineers working in the fields of ecological engineering, environmental science, and biotechnology, the Handbook of Ecological and Ecosystem Engineering also belongs on the bookshelves of environmental regulators and consultants, policy makers, and employees of non-governmental organizations working on sustainable development. Agriculture is currently facing multi-faceted threats in the form of unpredictable weather variability, frequent droughts and scarcity of irrigation water, together with the degradation

of soil resources and declining environmental health. These stresses result in the modification of plant physiology to impart greater resilience to changing abiotic and biotic environments, but only at the cost of declining plant productivity. In light of these facts, assessing the status of natural resource bases, and understanding the mechanisms of soil-plant-environment interactions so as to devise adaptation and mitigation approaches, represent great and imminent challenges for all of us. In this context, it is essential to understand the potential applications of modern tools, existing coping mechanisms and their integration, as this will allow us to develop suitable advanced mitigation strategies. From a broader perspective, the book deals with crop-environment interaction in the context of changing climatic conditions. To do so, it addresses four major aspects: Understanding the mechanism of carbon dynamics in the soil-plant-environment continuum; greenhouse gas fluxes in agricultural systems; and soil properties influenced by climate change and carbon sequestration processes. Mitigation and management of the photo-thermal environment to improve crop productivity; soil health under variable climate; reducing agro-ecosystem evapotranspiration losses through biophysical controls; and heat stress in field crops and its management. Studying the impact of climate change on biotic environments; insect-pest interactions; manifestations of disease; and adaptation strategies for island agro-ecosystems. Innovative approaches to assess stress impacts in crops, such as crop modeling, remote sensing, spectral stress indices etc. The book presents a collection of contributions from authoritative experts in their

respective fields. Offering young researchers new perspectives and future research directions, it represents a valuable guide for graduate students and academics alike. "This pioneering monograph solely deals with the Magneto Thermoelectric Power (MTP) in Heavily Doped (HD) Quantized Structures. The materials considered range from HD quantum confined nonlinear optical materials to HgTe/CdTe HD superlattices with graded interfaces and HD effective mass superlattices under magnetic quantization. An important concept of the measurement of the band gap in HD optoelectronic materials in the presence of external photo-excitation has been discussed in this perspective. The influences of magnetic quantization, crossed electric and quantizing fields, the intense electric field on the TPM in HD semiconductors and superlattices are also discussed. This book contains 200 open research problems which form the integral part of the text and are useful for both PhD aspirants and researchers in the various fields for which this particular series is dedicated"-- This book presents the Einstein Relation(ER) in two-dimensional (2-D) Heavily Doped (HD) Quantized Structures. The materials considered are quantized structures of HD non-linear optical, III-V, II-VI, Ge, Te, Platinum Antimonide, stressed materials, GaP, Gallium Antimonide, II-V, Bismuth Telluride together with various types of HD superlattices and their Quantized counterparts respectively. The ER in HD opto-electronic materials and their nanostructures is studied in the presence of strong light waves and intense electric fields on the basis of newly formulated electron dispersion laws that control the studies of such

quantum effect devices. The suggestion for the experimental determination of HD 2D and 3D ERs and the importance of measurement of band gap in HD optoelectronic materials under intense built-in electric field in nanodevices and strong external photo excitation (for measuring photon induced physical properties) are also discussed in this context. The influence of crossed electric and quantizing magnetic fields on the ER of the different 2D HD quantized structures (quantum wells, inversion and accumulation layers, quantum well HD superlattices and nipi structures) under different physical conditions is discussed in detail. This monograph contains 100 open research problems which form the integral part of the text and are useful for both Ph.D aspirants and researchers in the fields of condensed matter physics, solid-state sciences, materials science, nano-science and technology and allied fields.

Emerging Tools for Emerging Symbioses—Using Genomics Applications to Studying Endophytes

Abiotic Stress in Plants

Crop Protection and Resource Management

The Supercontinent Connection

Proceedings of the International Conference on Computational Science and Engineering (Beliaghata, Kolkata, India, 4-6 October 2016)

Soil organic carbon (SOC), a key component of the global carbon (C) pool, plays an important role in C

cycling, regulating climate, water supplies and biodiversity, and therefore in providing the ecosystem services that are essential to human well-being. Most agricultural soils in temperate regions have now lost as much as 60% of their SOC, and as much as 75% in tropical regions, due to conversion from natural ecosystems to agricultural uses and mainly due to continuous soil degradation. Sequestering C can help to offset C emissions from fossil fuel combustion and other C-emitting activities, while also enhancing soil quality and long-term agronomic productivity. However, developing effective policies for creating terrestrial C sinks is a serious challenge in tropical and subtropical soils, due to the high average annual temperatures in these regions. It can be accomplished by implementing improved land management practices that add substantial amounts of biomass to soil, cause minimal soil disturbance, conserve soil and water, improve soil structure, and enhance soil fauna activity. Continuous no-till crop production is arguably the best example. These soils need technically sound and economically feasible strategies to sustainably enhance their SOC pools. Hence, this book provides comprehensive information on SOC and its management in different land-use systems, with a focus on preserving soils and their ecosystem services. The only book of its kind, it offers a valuable asset for students, researchers, policymakers and other stakeholders involved in the sustainable development and management of natural resources at the global level.

Ending hunger, achieving food security and promoting sustainable development are at the top of the list of United Nations (UN) sustainable global development priorities. In the times of high population growth and increasing pressure of agricultural systems, efficiency in use of natural resources has been at the epicenter of sustainable agricultural. The concept of 'Input efficiency' implies production of high quantity and quality of food, from using only finite natural resources as inputs, in the form of mainly land, water, nutrients, energy, or biological diversity. In this book, editors provide a roadmap to the

food, nutritional, and environmental security in the agricultural systems. They share insight into the approaches that can be put in practice for increasing the input use efficiency in the cropping systems and achieve stability and sustainability of agricultural production systems. This book is of interest to teachers, researchers, climate change scientists, capacity builders and policymakers. Also the book serves as additional reading material for undergraduate and graduate students of agriculture, agroforestry, agroecology, and environmental sciences. National and international agricultural scientists, policymakers will also find this to be a useful read.

Environmental insults such as extremes of temperature, extremes of water status, and deteriorating soil conditions pose major threats to agriculture and food security. Employing contemporary tools and techniques from all branches of science, attempts are being made worldwide to understand how plants respond to abiotic stresses with the aim to manipulate plant performance that is better suited to withstand these stresses. This book searches for possible answers to several basic questions related to plant responses towards abiotic stresses. Synthesizing developments in plant stress biology, the book offers strategies that can be used in breeding, including genomic, molecular, physiological, and biotechnological approaches that have the potential to develop resilient plants and improve crop productivity worldwide.

The importance of the effective mass (EM) is already well known since the inception of solid-state physics and this first-of-its-kind monograph solely deals with the quantum effects in EM of heavily doped (HD) nanostructures. The materials considered are HD quantum confined nonlinear optical, III-V, II-VI, IV-VI, GaP, Ge, PtSb₂, stressed materials, GaSb, Te, II-V, Bi₂Te₃, lead germanium telluride, zinc and cadmium diphosphides, and quantum confined III-V, II-VI, IV-VI, and HgTe/CdTe superlattices with graded interfaces and effective mass superlattices. The presence of intense light waves in

optoelectronics and strong electric field in nano-devices change the band structure of semiconductors in fundamental ways, which have also been incorporated in the study of EM in HD quantized structures of optoelectronic compounds that control the studies of the HD quantum effect devices under strong fields. The importance of measurement of band gap in optoelectronic materials under intense external fields has also been discussed in this context. The influences of magnetic quantization, crossed electric and quantizing fields, electric field and light waves on the EM in HD semiconductors and super-lattices are discussed. The content of this book finds twenty-eight different applications in the arena of nano-science and nano-technology. This book contains 200 open research problems which form the integral part of the text and are useful for both PhD aspirants and researchers in the fields of condensed matter physics, materials science, solid state sciences, nano-science and technology and allied fields in addition to the graduate courses in semiconductor nanostructures. The book is written for post-graduate students, researchers, engineers and professionals in the fields of condensed matter physics, solid state sciences, materials science, nanoscience and technology and nanostructured materials in general.

New Horizons in Wheat and Barley Research

New Research and Strategies

Impacts of Climate Change on Agriculture and Aquaculture

Debye Screening Length

Innovations in Agriculture for a Self-Reliant India

This book begins with an introduction of nanobiotechnology, followed by biosyntheses of AgNPs, development of silver/chitosan (Ag/CS) polymer nanocomposites, synthesis of

silver/chitosan-g-poly acrylamide (Ag/CS-g-PAAm) nanocomposite hydrogel and silver/chitosan/poly vinyl chloride (Ag/CS/PVC) blend. Finally, it presents novel bioengineering of polyfunctional metallic nanostructures other than Ag, emphasizing biomass utilization and value-added conversion over an extended span, including life cycle assessment of the synthesized nanostructures. Features: Includes prospective cost effective, eco-friendly, and safe nanomaterials, synthesized through facile paths Covers the synergistic effect of phytochemicals and nano-Ag antimicrobial agents from an antiviral perspective Includes surface coating systems and super absorbent materials for biomedical purposes Examines nanobiotechnological applications for generating nanoalloys with synchronized nanostructural arrangement of alkaline earth metals and nanoscale dots of transition metals Explores the life cycle assessment of synthesized nanomaterials This book aims at researchers and graduate students in biomaterials, chemical engineering, green chemistry, nanomaterials, and biotechnology. This document presents the technical details of the first ever country-driven Global Soil Organic Carbon Sequestration

Potential Map (GSOCseq). This map allows for the estimation of top (0–30 cm) soil organic carbon sequestration potential in agricultural areas under a business as usual and three sustainable soil management scenarios. The Global Soil Organic Carbon Sequestration Potential Map (GSOCseq) stands out as a game-changing program aimed at bridging this divide by raising technical expertise on SOC sequestration potential modeling and mapping while relying on a uniquely participatory and iterative process. The GSOCseq v1.1 was developed based on the submissions of national experts appointed by the Food and Agriculture Organization of the United Nations (FAO) Member Nations. Each of the appointed National Experts generated national maps following a bottom-up approach that was facilitated and coordinated by the Secretariat of FAO's Global Soil Partnership (GSP).

Handbook of Ecological and Ecosystem Engineering

Advances in Agronomy

Microbial Ecotoxicology Advances to Improve Environmental and Human Health Under Global Change

Assam Directory and Tea Areas Handbook

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