

Magnetic Data Modelling Geosoft

Beginning with 1999 first issue of the year devoted to coverage of the International ASEG Conference and Exhibition.

Contains 33 chapters embracing both the continental as well as offshore geology of South Africa. Arranged in ascending order from the oldest formations in the Barberton granite-greenstone terrane to the coastal and interior Mesozoic and Cenozoic deposits that developed following the breakup of the Gondwana supercontinent. Also provides a broad framework covering the geological setting and environment of the varied mineral resources encountered throughout the region.

This combination of textbook and reference manual provides a comprehensive account of gravity and magnetic methods for exploring the subsurface using surface, marine, airborne and satellite measurements. It describes key current topics and techniques, physical properties of rocks and other earth materials, and digital data analysis methods used to process and interpret anomalies for subsurface information. Each chapter starts with an overview and concludes by listing key concepts to consolidate new learning. An accompanying website presents problem sets and interactive computer-based exercises, providing hands-on experience of processing, modeling and interpreting data. A comprehensive online suite of full-color case histories illustrates the practical utility of modern gravity and magnetic surveys. This is an ideal text for advanced undergraduate and graduate courses and reference text for research academics and professional geophysicists. It is a valuable resource for all those interested in petroleum, engineering, mineral, environmental, geological and archeological exploration of the lithosphere.

"Extending from Colorado, USA, on the north to the state of Chihuahua, Mexico, on the south, the Rio Grande rift divides the Colorado Plateau on the west from the interior of the North American craton on the east. This volume focuses on the Rio Grande rift's upper crustal basins and is organized geographically with study areas progressing from north to south. Nineteen chapters cover a variety of topics, including sedimentation history, rift basin geometries and the influence of older structure on rift basin evolution, faulting and strain transfer within and among basins, relations of magmatism to rift tectonism, and basin hydrogeology"--Provided by publisher.

Geological Interpretation of Aeromagnetic Data

Opening and Closure of the Neuquén Basin in the Southern Andes

International Mine Computing

Software to Perform Unconstrained 3D Inversion of Magnetic Data

Gravity and Magnetic Exploration

The History of Geophysics in Southern Africa

Understanding the Deccan in Southern India is important for deciphering the India–Sevshelles rifting mechanism. This book presents 13 studies that address the development of this province from diverse perspectives including field structural geology, geochemistry, analytical modelling, geomorphology and geophysics (e.g. palaeomagnetism, gravity and magnetic anomalies, and seismic imaging). Together, these papers indicate that the tectonics of Deccan is much more complicated than previously thought. Key findings include: the Deccan province can be divided into several blocks; the existence of a rift-induced palaeo-slope; constraints on the eruption period; rift–drift transition mechanisms determined for magma-rich systems; the tectonic role of the Deccan or Réunion plumes; sub-surface structures reported from boreholes; the delineation of the crust–mantle structure; the documentation of sub-surface tectonic boundaries; post-Deccan-Trap basin inversion; deformed dykes around Mumbai, and also from the eastern part of the Deccan Traps, documented in the field.

This Special Issue contains ten papers which focus on emerging geophysical techniques for mineral exploration, novel modeling, and interpretation methods, including joint inversions of multi physics data, and challenging case studies. The papers cover a wide range of mineral deposits, including banded iron formations, epithermal gold-silver-copper-iron-molybdenum deposits, iron-oxide-copper-gold deposits, and prospecting for groundwater resources.

How to Write Web Copy and Social Media Content: Spruce up Your Website Copy, Blog Posts and Social Media Content is more than an online writing book. While writing for online media is the focus, the book takes writers through the important writing process—showing them how to think before they write. Then it demonstrates how to apply this process to website copy, including structuring copy on websites, blog posts and social media such as Twitter, Facebook and LinkedIn. This book is for those who want to make their website and blog copy sparkle and boost the effectiveness of their social media content. The book is based on business-writing and online and social media copywriting courses that the author teaches for University of Toronto continuing education students and for corporate clients. In short, How to Write Web Copy and Social Media Content will help you organize your thoughts before you write, become a more effective and efficient online writer, make your points in a concise and easy to read/scan manner, achieve your purpose and obtain feedback (if so desired). This book is all about communicating more effectively online so your readers understand why you are writing and what action, if any (remember, a “click” is an action), you need them to take. It is filled with samples, examples and exercises to get you writing for various online media.

The subjects of the papers that make up the volume vary from the preparation of national maps to examples of the many uses of regional maps. The anomalies that are discussed range in areal dimension from hundreds of kilometers to tons of meters. The majority of the papers illustrate the utility of the maps in mapping structures and lithologic variations within the continental crust, the configuration of the crystalline basements rocks, zones of crustal weakness, distribution of extrusive and intrusive igneous rocks and the geometry of sedimentary basins. Most cases are drawn from the United States and Canada, but examples from Europe, Africa, South America and Asia are included.

From Exploration to Sustainability Assessment

A Reappraisal of Crustal Structure, Tectonostratigraphy and Magmatic Evolution

The Magnetic Field of the Earth's Lithosphere

Geophysical Inverse Theory and Regularization Problems

How to Write Web Copy and Social Media Content

Advances in Modeling and Interpretation in Near-Surface Geophysics

Remote sensing data and methods are increasingly being implemented in assessments of volcanic processes and risk. This happens thanks to their capability to provide a spectrum of observation and measurement opportunities to accurately sense the dynamics, magnitude, frequency, and impacts of volcanic activity. This book includes research papers on the use of satellite, aerial, and ground-based remote sensing to detect thermal features and anomalies, investigate lava and pyroclastic flows, predict the flow path of lahars, measure gas emissions and plumes, and estimate ground deformation. The multi-disciplinary character of the approaches employed for volcano monitoring and the combination of a variety of sensor types, platforms, and methods that come out from the papers testify to the current scientific and technology trends toward multi-data and multi-sensor monitoring solutions. The added value of the papers lies in the demonstration of how remote sensing can improve our knowledge of volcanoes that pose a threat to local communities; back-analysis and critical review of recent volcanic eruptions and unrest periods; and improvement of modeling and prediction methods. Therefore, the selected case studies also demonstrate the societal impact that this scientific discipline can potentially have on volcanic hazard and risk management.

Covering ideas and methods while concentrating on fundamentals, this book includes wave motion; digital imaging; digital filtering; visualization aspects of the seismic reflection method; sampling theory; the frequency spectrum; synthetic seismograms; wavelet processing; deconvolution; seismic attributes; phase rotation; and seismic attenuation.

This interdisciplinary book is written for government and industry professionals who need a comprehensive, accessible guide to modern energy security. Introducing the ten predominant energy types, both renewable and non-renewable, the book illustrates the modern energy landscape from a geopolitical, commercial, economic and technological perspective. Energy is presented as the powerhouse of global economic activities. To ensure the uninterrupted supply of energy, nations, industries and consumers need to have options. Efficient energy security planning ensures that when a primary energy source is depleted, compromised or interrupted, an alternative energy source must be readily available. For this reason, the foundations of energy security are built upon the five pillars of Sustainability, Independence, Efficiency, Affordability and Accessibility. The numerous case studies presented in this book demonstrate that energy security may be compromised in the absence of one out of these five ingredients. The book also entertains the Triple-E notion of Energy Efficiency, Environmental integrity and Economies of scale, used by governments and corporations for energy optimization. One of the key strengths of the book is its ability effectively to cover various scientific disciplines, and several energy types, while remaining comprehensible. This book will be of much interest to security or logistics professionals, economists and engineers, as well as policymakers.

This collection of papers on geophysical inversion contains research and survey articles on where the field has been and where it's going, and what is practical and what is not. Topics covered include seismic tomography, migration and inverse scattering.

Remote Sensing of Volcanic Processes and Risk

The Leading Edge

Geoinformatics

Principles, Practices, and Applications

The Utility of Regional Gravity and Magnetic Anomaly Maps

U.S. Geological Survey Professional Paper

"The science of informatics in the broadest sense has been several thousands of years in the making. With the recent emergence of large storage devices and high-speed processing of data, it has become possible to organize vast amounts of data as digital products with ontologic tags and concepts for smart queries. Coupling this computational capability with earth science data defines the emerging field of geoinformatics. Since the science of geology was established several centuries ago, observations led to conclusions that were integrative in concept and clearly had profound implications for the birth of geology. As disciplinary information about Earth becomes more voluminous, the use of geoinformatics will lead to integrative, science-based discoveries of new knowledge about planetary systems. Twenty one research papers, co-authored by 96 researchers from both earth and computer sciences, provide the first-ever organized presentation of the science of informatics as it relates to geology. Readers will readily recognize the vast intellectual content represented by these papers as they seek to address the core research goals of geoinformatics."--Publisher's website.

DSIM3D provides a rapid, unconstrained 3D inversion of gridded magnetic data. It is a Geosoft GX implementation of an inversion approach (Pilkington, 2009) that produces a 3D susceptibility distribution from observed magnetic anomaly data. The GX accepts gridded magnetic data as input and produces a subsurface 3D distribution of magnetic susceptibilities due to an equally spaced array of dipoles. Input parameters include the depth of the model, the distance from the observation plane to the model, the maximum allowable number of iterations, an RMS error limit to terminate iterations, options for grid preconditioning, the initial model susceptibilities, the data noise level, the ambient magnetic field, and the magnetization inclination and declination. The output is a Geosoft voxel model.

This volume presents an exhaustive overview of major orebodies and mineral deposits of North Africa. It is intended both for academic researchers and especially for exploration geologists interested in mineral exploration in the northern part of the African continent. Recent changes in the mining laws of most countries in this region have encouraged international mining companies to invest in local mineral industries. Accordingly, this volume will be very useful for those professionals, as well as for researchers in the field of economic geology.

This report (218 pages) presents hydrogeologic, groundwater-monitoring, and hydrochemical studies by the Utah Geological Survey (UGS) in Snake Valley, Tule Valley, and Fish Springs Flat in Millard and Juab Counties, west-central Utah. Data from the newly established UGS groundwater-monitoring network establish current baseline conditions, and will help quantify the effects of future variations in climate and groundwater pumping. New hydrochemical data show that groundwater quality is generally good, major-solute chemistry varies systematically from recharge to discharge areas, and suggest that most groundwater was recharged over one thousand years ago, implying low recharge rates and/or long or slow flow paths. Two aquifer tests yield estimates of transmissivity and storativity for the carbonate-rock and basin-fill aquifers. Variations in the potentiometric surface, hydrogeology, and hydrochemistry are consistent with the hypothesis of regional groundwater flow from Snake Valley northeast to Tule Valley and Fish Springs. Collectively, our work delineates groundwater levels, flow, and chemistry in Snake Valley and adjacent basins to a much greater degree than previously possible, and emphasizes the sensitivity of the groundwater system to possible increases in groundwater pumping.

Near-Surface Applied Geophysics

Geomagnetic Observations and Models

The Satellite Perspective

Spruce up Your Website Copy, Blog Posts & Social Media Content

The NE Atlantic Region

Geophysics for Mineral Exploration

This volume brings together 17 comprehensive, data-rich analyses to provide an updated perspective on the Mexican Gulf of Mexico, Florida and northern Caribbean. The papers span a broad range of scales and disciplines from plate tectonic evolution to sub-basin scale analysis. Papers are broadly categorised into three themes: 1) geological evolution of the basins of the southern Gulf of Mexico in Mexico, Bahamas and Florida and their hydrocarbon potential. 2) evolution of the region's Late Cretaceous to Neogene orogens and subsequent denudation history; and 3) geological evolution of the basins and crustal elements of the northern Caribbean. This book and its extensive data sets are essential for all academic and exploration geoscientists working in this area. Two large wall maps are included as fold-outs.

The NAG-TEC project was a collaborative effort by the British Geological Survey, the Geological Survey of Denmark and Greenland, the Geological Survey of Ireland, the Geological Survey of the Netherlands, the Geological Survey of Northern Ireland, the Geological Survey of Norway, Iceland GeoSurvey and the Farosee Geological Survey (Jarðfeingi), along with a number of academic partners and significant support from industry. The main focus was to investigate the tectonic evolution of the region with a particular emphasis on basin evolution along conjugate margins. A key outcome was the development of a new tectonostratigraphic atlas and database that includes comprehensive geological and geophysical information relevant for understanding the Devonian to present evolution of the NE Atlantic margins. These provide the foundation upon which exploration of the area can build. This Special Publication provides some of the first scientific results and analysis based on the project, including regional stratigraphic analysis and correlations, crustal structure and interpretation of geophysical data sets, plate kinematics and the evolution of igneous provinces.

This volume provides comprehensive and authoritative coverage of all the main areas linked to geomagnetic field observation, from instrumentation to methodology, on ground or near-Earth. Efforts are also focused on a 21st century e-Science approach to open access to all geomagnetic data, but also to the data preservation, data discovery, data rescue, and capacity building. Finally, modeling magnetic fields with different internal origins, with their variation in space and time, is an attempt to draw together into one place the traditional work in producing models as IGRF or describing the magnetic anomalies.

This book provides an overview of newly gathered material focusing on the opening and closure of The Neuquén Basin. The Neuquén Basin contains the most important hydrocarbon reservoirs in Argentina and therefore is characterized by a profound knowledge of the sedimentation mechanisms and closure times. During the last 10 years a considerable amount of new information has been produced that illustrates a complex evolution that involves more than one synrift stage during its evolution, an aborted sag phase associated with the inception of a first foreland basin in late Early Cretaceous times, two extensional destabilizations in the Late Cretaceous-Paleocene and late Oligocene times and a Neogene magmatic expansion coetaneous to a last mountain building. These processes have produced a polyphasic complex structure that exhumed the rich sedimentary record that characterizes the basin.

Digital Imaging and Deconvolution

Geophysical Inversion

General Problems, Sedimentary Basins and Island Arcs

DSIM3D

Encyclopedia of Solid Earth Geophysics

Potential Theory in Gravity and Magnetic Applications

The practical application of structural geology in industry is varied and diverse; it is relevant at all scales, from plate-wide screening of new exploration areas down to fluid-flow behaviour along individual fractures. From an industry perspective, good structural practice is essential since it feeds into the quantification and recovery of reserves and ultimately underpins commercial investment choices. Many of the fundamental structural principles and techniques used by industry can be traced back to the academic community, and this volume aims to provide insights into how structural theory translates into industry practice. Papers in this publication describe case studies and workflows that demonstrate applied structural geology, covering a spread of topics including trap definition, fault seal, fold-and-thrust belts, fractured reservoirs, fluid flow and geomechanics. Against a background of evolving ideas, new data types and advancing computational tools, the volume highlights the need for structural geologists to constantly re-evaluate the role they play in solving industrial challenges.

Geophysics is a comparatively young science which only evolved as a distinct discipline during the 19th century. However, its phenomena (like earthquakes, tsunamis, volcanic eruptions and lightning) had been objects of fear, curiosity and speculation since ancient times. In this book, Johan de Beer and his research team reveal that geophysical activity in South Africa can be traced back to as early as 1488. This is a truly astonishing revelation which deserves to be firmly entrenched as part of the country's proud history. The book also discusses the history and formation of South African geophysical institutions that made a huge and seldom acknowledged contribution to the technological development of southern Africa.

The past few decades have witnessed the growth of the Earth Sciences in the pursuit of knowledge and understanding of the planet that we live on. This development addresses the challenging endeavor to enrich human lives with the bounties of Nature as well as to preserve the planet for the generations to come. Solid Earth Geophysics aspires to define and quantify the internal structure and processes of the Earth in terms of the principles of physics and forms the intrinsic framework, which other allied disciplines utilize for more specific investigations. The first edition of the Encyclopedia of Solid Earth Geophysics was published in 1989 by Van Nostrand Reinhold publishing company. More than two decades later, this new volume, edited by Prof. Harsh K. Gupta, represents a thoroughly revised and expanded reference work. It brings together more than 200 articles covering established and new concepts of Geophysics across the various sub-disciplines such as Gravity, Geodesy, Geomagnetism, Seismology, Seismics, Deep Earth Processes, Plate Tectonics, Thermal Domains, Computational Methods, etc. in a systematic and consistent format and standard. It is an authoritative and current reference source with extraordinary width of scope. It draws its unique strength from the expert contributions of editors and authors across the globe. It is designed to serve as a valuable and cherished source of information for current and future generations of professionals.

This book is devoted to different aspects of tectonic research. Syntheses of recent and earlier works, combined with new results and interpretations, are presented in this book for diverse tectonic settings. Most of the chapters include up-to-date material of detailed geological investigations, often combined with geophysical data, which can help understand more clearly the essence of mechanisms of different tectonic processes. Some chapters are dedicated to general problems of tectonics. Another block of chapters is devoted to sedimentary basins and special attention in this book is given to tectonic processes on active plate margins.

An All Hazards Approach to Critical Infrastructure

Proceedings of the 17th Meeting of the Association of European Geological Societies

The ABCs of Seismic Exploration and Processing

Mineral Deposits of North Africa

The Basins, Orogens and Evolution of the Southern Gulf of Mexico and Northern Caribbean

Hydrogeologic Studies and Groundwater Monitoring in Snake Valley and Adjacent Hydrographic Areas, West-central Utah and East-central Nevada: report (304 pages), 4 Plates, Appendices and data tables

This book deals primarily with the aspects of advances in near surface geophysical data modeling, different interpretation techniques, new ideas and an integrated study to delineate the subsurface structures. It also involves the practical application of different geophysical methods to delineate the subsurface structures associated with mineral, groundwater exploration, subsurface contamination, hot springs, coal fire etc. This book is specifically aimed with the state-of-art information in these areas of study, coupled to extensive modeling and field investigations obtained from around the world. It is extremely enlightening for the research workers, scientists, faculty members and students, in Applied Geophysics, Near Surface Geophysics, Potential Field, Electrical and Electromagnetic Methods, Mathematical Modeling Techniques in Earth Sciences, as well as Environmental Geophysics.

Just a few meters below the Earth's surface lie features of great importance, from geological faults which can produce devastating earthquakes, to lost archaeological treasures! This refreshing, up-to-date book explores the foundations of Interpretation theory and the latest developments in near-surface techniques, used to complement traditional geophysical methods for deep-exploration targets. Clear but rigorous, the book explains theory and practice in simple physical terms. Techniques covered include magnetics, resistivity, seismic reflection and refraction, surface waves, induced polarization, self-potential, electromagnetic induction, ground-penetrating radar, magnetic resonance, interferometry, seismoelectric and more. Sections on data analysis and inverse theory are provided and chapters are illustrated by case studies, giving students and professionals the tools to plan, conduct and analyze a near-surface geophysical survey. This is an important text for graduate students in geophysics and a valuable reference for practising geophysicists, geologists, hydrologists, archaeologists, and civil and geotechnical engineers.

This text bridges the gap between the classic texts on potential theory and modern books on applied geophysics. It opens with an introduction to potential theory, emphasising those aspects particularly important to earth scientists, such as Laplace's equation, Newtonian potential, magnetic and electrostatic fields, and conduction of heat. The theory is then applied to the interpretation of gravity and magnetic anomalies, drawing on examples from modern geophysical literature. T forward modeling, inverse methods, depth-to-source estimation, ideal bodies, analytical continuation, and spectral analysis. The book includes numerous exercises and a variety of computer subroutines written in FORTRAN. Graduate students and researchers in geophysics will find this book essential.

Position, Navigation, and Timing Technologies in the 21st Century

Principles, Techniques and Integration

Data to Knowledge

New Frontiers in Tectonic Research

Industrial Structural Geology

Physics of Magnetism and Magnetic Materials

Covers the latest developments in PNT technologies, including integrated satellite navigation, sensor systems, and civil applications Featuring sixty-four chapters that are divided into six parts, this two-volume work provides comprehensive coverage of the state-of-the-art in satellite-based position, navigation, and timing (PNT) technologies and civilian applications. It also examines alternative navigation technologies based on other signals-of-opportunity and sensors and offers a comprehensive treatment on integrated PNT systems for consumer and commercial applications. Volume 1 of Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications contains three parts and focuses on the satellite navigation systems, technologies, and engineering and scientific applications. It starts with a historical perspective of GPS development and other related PNT development. Current global and regional navigation satellite systems (GNSS and RNSS), their inter-operability, signal quality monitoring, satellite orbit and time synchronization, and ground- and satellite-based augmentation systems are examined. Recent progresses in satellite navigation receiver technologies and challenges for operations in multipath-rich urban environment, in handling spoofing and interference, and in ensuring PNT integrity are addressed. A section on satellite navigation for engineering and scientific applications finishes off the volume. Volume 2 of Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications consists of three parts and addresses PNT using alternative signals and sensors and integrated PNT technologies for consumer and commercial applications. It looks at PNT using various radio signals-of-opportunity, atomic clock, optical, laser, magnetic field, celestial, MEMS and inertial sensors, as well as the concept of navigation from Low-Earth Orbiting (LEO) satellites. GNSS-INSS integration, neuroscience of navigation, and animal navigation are also covered. The volume finishes off with a collection of work on contemporary PNT applications such as survey and mobile mapping, precision agriculture, wearable systems, automated driving, train control, commercial unmanned aircraft systems, aviation, and navigation in the unique Arctic environment. In addition, this text: Serves as a complete reference and handbook for professionals and students interested in the broad range of PNT subjects Includes chapters that focus on the latest developments in GNSS and other navigation sensors, techniques, and applications Illustrates interconnecting relationships between various types of technologies in order to assure more protected, tough, and accurate PNT Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications will appeal to all industry professionals, researchers, and academics involved with the science, engineering, and applications of position, navigation, and timing technologies. pnt2book.com

This monograph is a critical review of the geophysical inverse theory and combines them with the related research in geophysical inversion carried out in the West. It presents a detailed exposition of the methods of regularized solution of inverse problems based on the ideas of Tikhonov regularization, and shows the different forms of their applications in both linear and nonlinear methods of geophysical inversion. This text is the first to treat many kinds of inversion and imaging techniques in a unified mathematical manner. The book is divided in five parts covering the foundations of the inversion theory and its applications to the solution of different geophysical inverse problems, including potential field, electromagnetic, and seismic methods. Unique in its focus on providing a link between the methods used in gravity, electromagnetic, and seismic imaging and inversion, it represents an exhaustive treatise on inversion theory. Written by one of the world's foremost experts, this work is widely recognized as the ultimate researcher's reference on geophysical inverse theory and its practical scientific applications. Presents state-of-the-art geophysical inverse theory developed in modern mathematical terminology—the first to treat many kinds of inversion and imaging techniques in a unified mathematical way. Provides a critical link between the methods used in gravity, electromagnetic, and seismic imaging and inversion, and represents an exhaustive treatise on geophysical inversion theory. Features more than 300 illustrations, figures, charts and graphs to underscore key concepts. Reflects the latest developments in inversion theory and applications and captures the most significant changes in the field over the past decade.

The Geology of South Africa

Tectonics of the Deccan Large Igneous Province

Mineral Resources

Managing Energy Security

Integrated Satellite Navigation, Sensor Systems, and Civil Applications

The Geology in Digital Age

In this book, the fundamentals of magnetism are treated, starting at an introductory level. The origin of magnetic moments, the response to an applied magnetic field, and the various interactions giving rise to different types of magnetic ordering in solids are presented and many examples are given. Crystalline-electric-field effects are treated at a level that is sufficient to provide the basic knowledge necessary in understanding the properties of materials in which these effects play a role. Itinerant-electron magnetism is presented on a similar basis. Particular attention has been given to magnetocrystalline magnetic anisotropy and the magnetocaloric effect. Also, the usual techniques for magnetic measurements are presented. About half of the book is devoted to magnetic materials and the properties that make them suitable for numerous applications. The state of the art is presented of permanent magnets, high-density recording materials, soft-magnetic materials, Invar alloys and magnetostrictive materials. Many references are given.

Abstracts and papers of the 17 MAEGS.

Preview

New Perspectives on Rio Grande Rift Basins: From Tectonics to Groundwater

U.S. Geological Survey Bulletin

Ghadâmis, Jifârah, Tarâbus and Sabrâtah Basins : Second Symposium on the Sedimentary Basins of Libya

Inverse Theory and Applications in Geophysics

The Geology of Northwest Libya