

Seismology And Plate Tectonics

This volume is the outcome of about 30 years of research in the field of earthquake seismology in various parts of South Asia. It comprehensively deals with topics ranging from plate tectonics to seismic waves in general. State-of-the-art techniques in earthquake location/relocation, fault plane solution, waveform inversion, seismic tomography, fractals etc. are discussed, and the results are interpreted in terms of seismic source processes in the region.

This book is devoted to different aspects of tectonic researches, especially to modern geodynamic processes. Syntheses of recent and earlier works, combined with new results and interpretations, are presented here for diverse tectonic settings. Most of chapters include up-to-date materials of detailed geological-geophysical investigations, which can help more clearly understand the essence of mechanisms of different tectonic processes. Among general problems of tectonics are discussed processes in axes of slow-spreading mid-ocean ridges on example of central part of Mid-Atlantic Ridge and in continental collision zones. Formation of sedimentary basins are considered on examples of Niger Delta, Triassic Cuyana Basin (Argentina), and Mesozoic and Cenozoic basins of the Alpine margin (Tunisia); neotectonic processes examined in Turkey and Morocco; tectonic evolution of the southern margin of Laurasia in the Paleozoic discussed as well as interrelation of western Troms-Lofoten and the Lewisian complexes in the Middle Paleoproterozoic.

Volcanic seismology represents the main, and often the only, tool to forecast volcanic eruptions and to monitor the eruption process. This book describes the main types of seismic signals at volcanoes, their nature and spatial and temporal distributions at different stages of eruptive activity. Following from the success of the first edition, published in 2003, the second edition consists of 19 chapters including significant revision and five new chapters. Organized into four sections, the book begins with an introduction to the history and topic of volcanic seismology, discussing the theoretical and experimental models that were developed for the study of the origin of volcanic earthquakes. The second section is devoted to the study of volcano-tectonic earthquakes, giving the theoretical basis for their occurrence and swarms as well as case stories of volcano-tectonic activity associated with the eruptions at basaltic, andesitic, and dacitic volcanoes. There were 40 cases of volcanic eruptions at 20 volcanoes that occurred all over the world from 1910 to 2005, which are discussed. General regularities of volcano-tectonic earthquake swarms, their participation in the eruptive process, their source properties, and the hazard of strong volcano-tectonic earthquakes are also described. The third section describes the theoretical basis for the occurrence of eruption earthquakes together with the description of volcanic tremor, the seismic signals associated with pyroclastic flows, rockfalls and lahars, and volcanic

explosions, long-period and very-long-period seismic signals at volcanoes, micro-earthquake swarms, and acoustic events. The final section discuss the mitigation of volcanic hazard and include the methodology of seismic monitoring of volcanic activity, the examples of forecasting of volcanic eruptions by seismic methods, and the description of seismic activity in the regions of dormant volcanoes. This book will be essential for students and practitioners of volcanic seismology to understand the essential elements of volcanic eruptions. Provides a comprehensive overview of seismic signals at different stages of volcano eruption. Discusses dozens of case histories from around the world to provide real-world applications. Illustrations accompany detailed descriptions of volcano eruptions alongside the theories involved.

Developments in Geotectonics, 10: The Expanding Earth focuses on the principles, methodologies, transformations, and approaches involved in the expanding earth concept. The book first elaborates on the development of the expanding earth concept, necessity for expansion, and the subduction myth. Discussions focus on higher velocity under Benioff zone, seismic attenuation, blue schists and paired metamorphic belts, dispersion of polygons, arctic paradox, and kinematic contrast. The manuscript then ponders on the scale of tectonic phenomena, non-uniformitarianism, tectonic profiles, and paleomagnetism. Concerns cover global paleomagnetism, general summary of the tectonic profile, implosions, fluid pressures, pure shear, crustal extension, simple shear with horizontal axis, geological examples of scale fields, and length-time fields of deformation. The publication explores the cause of expansion, modes of crustal extension, and rotation and asymmetry of the earth, including dynamic asymmetry, precessions, nutations, librations, and wobbles at fixed obliquity, variation of rate of rotation, and categories of submarine ridges. The text is a dependable source of data for researchers wanting to study the concept of expanding earth.

Recent Advances

A Study in Seismology and Plate Tectonics

Past, Present and Future Impacts on Earth Sciences

Northeast Siberia and Alaska

Plate Tectonics, Earthquake, Earthquake Engineering, Shear Wave Splitting, Seismic Inversion, Seismic

Unix, Ambient Vibrations, Society Of

The Seismicity and Plate Tectonics in Eurasia

Presents an introduction to volcanoes and earthquakes, explaining how the movement of the Earth's interior plates cause their formation and describing the volcanoes which currently exist around the world as well as some of the famous earthquakes of the nineteenth through twenty-first centuries.

This book provides a guide to understanding of seismograms for graduate students, researchers, professionals in academia and the petroleum industry.

The destructive force of earthquakes has stimulated human inquiry since ancient times, yet the scientific study of earthquakes is a surprisingly recent endeavor. Instrumental recordings of earthquakes were not made until the second half of the 19th century, and the primary mechanism for generating seismic waves was not identified until the beginning of the 20th century. From this recent start, a range of laboratory, field, and theoretical investigations have developed into a vigorous new discipline: the science of earthquakes. As a basic science, it provides a comprehensive understanding of earthquake behavior and related phenomena in the Earth and other terrestrial planets. As an applied science, it provides a knowledge base of great practical value for a global society whose infrastructure is built on the Earth's active crust. This book describes the growth and origins of earthquake science and identifies research and data collection efforts that will strengthen the scientific and social contributions of this exciting new discipline.

"Physical Geology is a comprehensive introductory text on the physical aspects of geology, including rocks and minerals, plate tectonics, earthquakes, volcanoes, glaciation, groundwater, streams, coasts, mass wasting, climate change, planetary geology and much more. It has a strong emphasis on examples from western Canada, especially British Columbia, and also includes a chapter devoted to the geological history of western Canada. The book is a collaboration of faculty from Earth Science departments at Universities and Colleges across British Columbia and elsewhere"--BCcampus website.

Continental Intraplate Earthquakes

25 Years of Plate Tectonics

A New Physics of Earthquakes

50 Years of Earth-Shaking Events

Seismological Investigations of Plate Tectonics in South Central Alaska

Earthquakes and Coseismic Surface Faulting on the Iranian Plateau

Consisting of more than 150 articles written by leading experts, this authoritative reference encompasses the entire field of solid-earth geophysics. It describes in detail the state of current knowledge, including advanced instrumentation and techniques, and focuses on important areas of exploration geophysics. It also offers clear and complete coverage of seismology, geodesy, gravimetry, magnetotellurics and related areas in the adjacent disciplines of physics, geology, oceanography and space science.

Earthquakes and Coseismic Surface Faulting on the Iranian Plateau is a comprehensive and well-illustrated multi-disciplinary research work that analyzes the human and physical aspects of the active faults and large-magnitude earthquakes since ancient times on the Iranian Plateau. The long-term historical, archaeological, and sociological record of earthquakes discussed here gives insight into earthquake magnitudes, recurrences, fault segmentation, clustering, and patterns of coseismic ruptures from prehistoric times to the present. The first part of the book examines oral traditions and literature of the region concerned with earthquakes, particularly in folklore, epic literature, and theology. The second part assesses dynamic phenomena associated with earthquakes, including active tectonics, archaeoseismicity, and coseismic surface

faulting throughout the twentieth century. This work is a valuable technical survey and an essential reference for understanding seismic hazard analysis and earthquake risk minimization in earthquake-prone developing and developed countries throughout the world. Provides a reference for seismic hazard evaluation and analysis Covers data dealing with crustal deformations caused by earthquake faulting and folding since historic times Presents unique and complete data for use in empirical relation analyses in all regions

Developments in Earthquake Engineering have focussed on the capacity and response of structures. They often overlook the importance of seismological knowledge to earthquake-proofing of design. It is not enough only to understand the anatomy of the structure, you must also appreciate the nature of the likely earthquake. Seismic design, as detailed in this book, is the bringing together of Earthquake Engineering and Engineering Seismology. It focuses on the seismological aspects of design – analyzing various types of earthquake and how they affect structures differently. Understanding the distinction between these earthquake types and their different impacts on buildings can make the difference between whether a building stands or falls, or at least to how much it costs to repair. Covering the basis and basics of the major international codes, this is the essential guide for professionals working on structures in earthquake zones around the world.

Published by the American Geophysical Union as part of the Special Publications Series, Volume 6. During the decade of the 1960s, science of the solid earth underwent an astonishing and awesome upheaval. In just a few years, geoscientists constructed a new way of describing and understanding the dynamics of everchanging earth, past and present, and so found a route to explanation for how most, if not all, of the great features of the earth's surface that have harbored and plagued and enchanted humans throughout their existence came to be. Continents, ocean basins, mountain ranges, deep sea trenches, earthquakes, and volcanoes suddenly became explicable as consequences of earth movements that, on a global scale, have a remarkably simple and readily understandable pattern. The long-sought key to the ponderous and agonizingly slow movements of earth that, over millennia, have deftly shaped our surroundings was found during that decade, or so most scientists think today, more than a quarter of a century later.

Seismology

A Geological Controversy

Plate Tectonics and Disasters

International Handbook of Earthquake & Engineering Seismology

An Introduction to Seismology, Earthquakes, and Earth Structure

Quakeland

This introduction to seismological theory and the principles of plate tectonics also develops a practical approach to the interpretation of seismograms for physicists and mathematicians as well as geologists.

Modern scientific investigations of earthquakes began in the 1880s, and the International Association of Seismology was organized in 1901 to promote collaboration of scientists and engineers in studying earthquakes. The International Handbook of Earthquake and Engineering Seismology, under the auspices of the International Association of Seismology

and Physics of the Earth's Interior (IASPEI), was prepared by leading experts under a distinguished international advisory board and team of editors. The content is organized into 56 chapters and includes over 430 figures, 24 of which are in color. This large-format, comprehensive reference summarizes well-established facts, reviews relevant theories, surveys useful methods and techniques, and documents and archives basic seismic data. It will be the authoritative reference for scientists and engineers and a quick and handy reference for seismologists. Also available is The International Handbook of Earthquake and Engineering Seismology, Part B. Two CD-ROMs containing additional material packaged with the text. An overview of the history, geology, geomorphology, geophysics, and seismology of the most well known plate tectonic boundary in the world.

This title presents the history of seismology. Vivid text details how early theories led to our modern understanding of the forces behind earthquakes and volcanoes. It also puts a spotlight on the brilliant scientists who made these advances possible. Useful sidebars, rich images, and a glossary help readers understand the science and its importance. Maps and diagrams provide context for critical discoveries in the field. Aligned to Common Core Standards and correlated to state standards. Essential Library is an imprint of Abdo Publishing, a division of ABDO.

Plate Tectonics, Volcanoes, and Earthquakes

Plate Tectonics and Great Earthquakes

Shocks and Rocks

Perspectives in Modern Seismology

An Overview of the History, Geology, Geomorphology, Geophysics, and Seismology of the Most Well Known Plate-tectonic Boundary in the World

Plate Tectonics

Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. Pages: 67. Chapters: Plate tectonics, Earthquake, Earthquake engineering, Shear wave splitting, Seismic inversion, Seismic Unix, Ambient Vibrations, Society of Exploration Geophysicists, List of free geophysics software, Seismic to simulation, First break picking, Synthetic seismogram, Seismic scale, Focal mechanism, Seismic attribute, Seismic communication, Seismotectonics, Foreshock, Return period, Iseismal map, Supershear earthquake, Exploration diamond drilling, Seismite, Well to Hell hoax, Seismic response of landfill, Microseism, Microtremor, Glacial earthquake, Lunar seismology, Seismo-electromagnetics, Beijing Anomaly, Gardner's

relation, Arias Intensity, Seismic trace, Normal Move Out, Slowness, Microearthquake, Characteristic earthquake, Long period ground motion.

A multidisciplinary update on continental plate tectonics and plate boundary discontinuities Understanding the origin and evolution of the continental crust continues to challenge Earth scientists. Lithospheric Discontinuities offers a multidisciplinary review of fine scale layering within the continental lithosphere to aid the interpretation of geologic layers. Once Earth scientists can accurately decipher the history, internal dynamics, and evolution of the continental lithosphere, we will have a clearer understanding of how the crust formed, how plate tectonics began, and how our continents became habitable. Volume highlights: Theories and observations of the current state of tectonic boundaries and discontinuities Contributions on field observations, laboratory experiments, and geodynamic predictions from leading experts in the field Mantle fabrics in response to various mantle deformation processes Insights on fluid distribution using geophysical observations, and thermal and viscosity constraints from dynamic modeling Discontinuities associated with lithosphere and lithosphere-asthenosphere boundary An integrated study of the evolving physical and chemical processes associated with lithosphere asthenosphere interaction Written for academic and research geoscientists, particularly in the field of tectonophysics, geophysicists, geodynamics, seismology, structural geology, environmental geology, and geoengineering, Lithospheric Discontinuities is a valuable resource that sheds light on the origin and evolution of plate interaction processes.

The theory of plate tectonics transformed earth science. The hypothesis that the earth's outermost layers consist of mostly rigid plates that move over an inner surface helped describe the growth of new seafloor, confirm continental drift, and explain why earthquakes and volcanoes occur in some places and not others. Lynn R. Sykes played a key role in the birth of plate tectonics, conducting revelatory research on earthquakes. In this book, he gives an invaluable insider's perspective on the theory's development and its implications. Sykes combines lucid explanation of how plate tectonics revolutionized geology with unparalleled personal reflections. He entered the field when it was on the

cusps of radical discoveries. Studying the distribution and mechanisms of earthquakes, Sykes pioneered the identification of seismic gaps—regions that have not ruptured in great earthquakes for a long time—and methods to estimate the possibility of quake recurrence. He recounts the various phases of his career, including his antinuclear activism, and the stories of colleagues around the world who took part in changing the paradigm. Sykes delves into the controversies over earthquake prediction and their importance, especially in the wake of the giant 2011 Japanese earthquake and the accompanying Fukushima disaster. He highlights geology's lessons for nuclear safety, explaining why historic earthquake patterns are crucial to understanding the risks to power plants. Plate Tectonics and Great Earthquakes is the story of a scientist witnessing a revolution and playing an essential role in making it.

The Omega-Theory: A New Physics of Earthquakes, Second Edition offers a unifying, mathematical framework to describe and answer the most pressing and unexamined dilemmas of earthquake sequences. Those in the fields of seismology and geology are currently faced with a vast and complex mathematical structure, involving many new, natural laws and theorems. This book interprets this structure as a new physical theory and paradigm, helping users understand the tectonic and seismic processes within the Earth. As such, it is an essential resource for future researchers in the fields of structural geology, physics of the Earth, and seismology. In the last decades, generations of seismologists, geophysicists, and geologists have accumulated enough knowledge and information to allow for the reformulation and solution of this essential problem. Hence, this book provides a great resource for researchers and professionals. Brings together twenty years of research in the field of geophysics and attacks the problem within the framework of the Cosserat continuum theory Heavily tested on tens of natural examples and numerical tests Includes 350 color figures and graphs Spans across many fields of theoretical physics and geology, such as plate tectonics, synchronization of chaotic systems, solitons and fractals, mathematical set theory, and quantum mechanics

Seismology: Our Violent Earth

The Seismic Wavefield: Volume 1, Introduction and Theoretical Development

What We Know (and Don't Know) about Earthquakes

The Continental Drift Controversy

Seismology and Tectonics of the North American Plate in the Arctic

The Omega-Theory

This book provides an overview of the history of plate tectonics, including in-context definitions of the key terms. It explains how the forerunners of the theory and how scientists working at the key academic institutions competed and collaborated until the theory coalesced.

A journey around the United States in search of the truth about the threat of earthquakes leads to spine-tingling discoveries, unnerving experts, and ultimately the kind of preparations that will actually help guide us through disasters. It ' s a road trip full of surprises. Earthquakes. You need to worry about them only if you ' re in San Francisco, right? Wrong. We have been making enormous changes to subterranean America, and Mother Earth, as always, has been making some of her own. . . . The consequences for our real estate, our civil engineering, and our communities will be huge because they will include earthquakes most of us do not expect and cannot imagine—at least not without reading Quakeland. Kathryn Miles descends into mines in the Northwest, dissects Mississippi levee engineering studies, uncovers the horrific risks of an earthquake in the Northeast, and interviews the seismologists, structural engineers, and emergency managers around the country who are addressing this ground shaking threat. As Miles relates, the era of human-induced earthquakes began in 1962 in Colorado after millions of gallons of chemical-weapon waste was pumped underground in the Rockies. More than 1,500 quakes over the following seven years resulted. The Department of Energy plans to dump spent nuclear rods in the same way. Evidence of fracking ' s seismological impact continues to mount. . . . Humans as well as fault lines built our “ quakeland ” . What will happen when Memphis, home of FedEx's 1.5-million-packages-a-day hub, goes offline as a result of an earthquake along the unstable Reelfoot Fault? FEMA has estimated that a modest 7.0 magnitude quake (twenty of these happen per year around the world) along the Wasatch Fault under Salt Lake City would put a \$33 billion dent in our economy. When the Fukushima reactor melted down, tens of thousands were displaced. If New York ' s Indian Point nuclear power plant blows, ten million people will be displaced. How would that evacuation even begin? Kathryn Miles ' tour of our land is as fascinating and frightening as it is irresistibly compelling.

This book goes into great detail about the different layers of the Earth and how the shifting tectonic plates can cause natural disasters, such as earthquakes and tsunamis. In-depth information and stunning photographs reinforce the informative text.

Since the advent of the mantle plume hypothesis in 1971, scientists have been faced with the problem that its predictions are not confirmed by observation. For thirty years, the usual reaction has been to adapt the hypothesis in numerous ways. As a result, the multitude of current plume variants now amounts to an unfalsifiable hypothesis. In the early 21st century demand became relentless for a theory that can explain melting anomalies in a way that fits the observations naturally and is forward-predictive. From this the Plate hypothesis emerged—the exact inverse of the Plume hypothesis. The Plate hypothesis attributes melting anomalies to shallow effects directly related to plate tectonics. It rejects the hypothesis that surface volcanism is driven by convection in the deep mantle. Earth Science is currently in the midst of the kind of paradigm-challenging debate that occurs only rarely in any field. This volume comprises its first handbook. It reviews the Plate and Plume hypotheses, including a clear statement of the former. Thereafter it follows an observational approach, drawing widely from many volcanic regions in chapters on vertical motions of Earth's crust, magma volumes, time-progressions of volcanism, seismic imaging, mantle temperature and geochemistry. This text: Deals with a paradigm shift in Earth Science - some say the most important since plate tectonics Is analogous to Wegener's The Origin of Continents and Oceans Is written to be accessible to scientists and students from all specialities This book is indispensable to Earth scientists from all specialties who are interested in this new subject. It is suitable as a reference work for those teaching relevant classes, and an ideal text for advanced undergraduates and graduate students studying plate tectonics and related topics. Visit Gillian's own website at <http://www.mantleplumes.org>

Tectonics

Plate Boundaries and Natural Hazards

Physical Geology

Perspectives on Earthquake Science

Microearthquake Seismology and Seismotectonics of South Asia

An Insider's History Of The Modern Theory Of The Earth

In 1915 Alfred Wegener's seminal work describing the continental drift was first published in German. Wegener explained various phenomena of historical geology, geomorphology, paleontology, paleoclimatology, and similar areas in terms of continental drift. This edition includes new data to support his theories, helping to refute the opponents of his controversial views. 64 illustrations.

Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume

179. This multidisciplinary monograph provides the first modern integrative summary focused on the most spectacular active tectonic systems in North America. Encompassing seismology, tectonics, geology, and geodesy, it includes papers that summarize the state of knowledge, including background material for those unfamiliar with the region; address global hypotheses using data from Alaska; and test important global hypotheses using data from this region. It is organized around four major themes: subduction and great earthquakes at the Aleutian Arc, the transition from strike slip to accretion and subduction of the Yakutat microplate, the Denali fault and related structures and their role in accommodating permanent deformation of the overriding plate, and regional integration and large-scale models and the use of data from Alaska to address important global questions and hypotheses. The book's publication near the beginning of the National Science Foundation's EarthScope project makes it especially timely because Alaska is perhaps the least understood area within the EarthScope footprint, and interest in the region can be expected to rise with time as more EarthScope data become available.

Some of the planet's most destructive forces—including earthquakes and volcanic activity—are caused by the same factors that helped shape much of the Earth as it is today. Plate tectonics, or movement of the Earth's outer layers, can occur in a number of different ways and produce a range of results, some minor and others far more considerable or devastating. Distinct maps, interesting sidebars, and annotated illustrations of the Earth's layers are included in this volume, which details the motion of the planet and the nature and study of both earthquakes and volcanoes.

"This volume brings together a sampling of research addressing issues of continental intraplate earthquakes, including a core of papers from special sessions held at the spring 2004 Joint Assembly of the American and Canadian Geophysical Unions in Montreal. Papers address the broad related topics of the science, hazard, and policy issues of large continental intraplate earthquakes in a worldwide context. One group of papers addresses aspects of the primary scientific issue--where are these earthquakes and what causes them? Answering this question is crucial to determining whether they will continue there or migrate elsewhere. A second group of papers addresses the challenge of assessing the hazard posed by intraplate earthquakes. Although it may be a very long time before the scientific issues are resolved, the progress being made is helping attempts to estimate the probability, size, and shaking of future

earthquakes, and the uncertainty of the results. A third group of papers explores the question of how society should mitigate the possible effects of future large continental intraplate earthquakes. Communities around the world face the challenge of deciding how to address this rare, but real, hazard, given the wide range of other societal needs. Continental intraplate earthquakes will remain a challenge to seismologists, earthquake engineers, policy makers, and the public for years to come, but significant progress toward understanding and addressing this challenge is now being made."--Publisher's website.

Earthshaking Science

Lithospheric Discontinuities

Science, Hazard, and Policy Issues

The Expanding Earth

Introduction to Volcanic Seismology

The Riviera Plate

The beginning of the new millennium has been particularly devastating in terms of natural disasters associated with tectonic plate boundaries, such as earthquakes in Sumatra, Chile, Japan, Tahiti, and Nepal; the Indian Ocean and the Pacific Ocean tsunamis; and volcanoes in Indonesia, Chile, Iceland that have produced large quantities of ash causing major disruption to aviation. In total, half a million people were killed by such natural disasters. These recurring events have increased our awareness of the destructive power of natural hazards and the major risks associated with them. While we have come a long way in the search for understanding such natural phenomena, and although our knowledge of Earth dynamics and plate tectonics has improved enormously, there are still fundamental uncertainties in our understanding of natural hazards.

Increased understanding is crucial to improve our capacity for hazard prediction and mitigation. Volume highlights include: Main concepts associated with tectonic plate boundaries Novel studies on boundary-related natural hazards Fundamental concepts that improve hazard prediction and mitigation Plate Boundaries and Natural Hazards will be a valuable resource for scientists and students in the fields of geophysics, geochemistry, plate tectonics, natural hazards, and climate science.

"Resolution of the sixty year debate over continental drift, culminating in the triumph of plate tectonics, changed the very fabric of Earth Science. This three-volume treatise on the continental drift controversy is the first complete history of the origin, debate and gradual acceptance of this revolutionary theory. Based on extensive interviews, archival papers and original works, Frankel weaves together the lives and work of the scientists involved, producing an accessible narrative for scientists and non-scientists alike. This first volume covers the period in the early 1900s when Wegener first pointed out that the Earth's major landmasses could be fitted together like a jigsaw and went on to propose that the continents had once been joined together in a single landmass, which he named Pangaea. It describes the reception of Wegener's theory as it splintered into sub-

controversies and geoscientists became divided between the 'fixists' and 'mobilists'--

The third edition of this widely acclaimed textbook provides a comprehensive introduction to all aspects of global tectonics, and includes major revisions to reflect the most significant recent advances in the field. A fully revised third edition of this highly acclaimed text written by eminent authors including one of the pioneers of plate tectonic theory. Major revisions to this new edition reflect the most significant recent advances in the field, including new and expanded chapters on Precambrian tectonics and the supercontinent cycle and the implications of plate tectonics for environmental change. Combines a historical approach with process science to provide a careful balance between geological and geophysical material in both continental and oceanic regimes. Dedicated website available at

<http://www.blackwellpublishing.com/kearey/> www.blackwellpublishing.com/kearey/

An Introduction to Seismology, Earthquakes and Earth Structures is an introduction to seismology and its role in the earth sciences, and is written for advanced undergraduate and beginning graduate students. The fundamentals of seismic wave propagation are developed using a physical approach and then applied to show how refraction, reflection, and teleseismic techniques are used to study the structure and thus the composition and evolution of the earth. The book shows how seismic waves are used to study earthquakes and are integrated with other data to investigate the plate tectonic processes that cause earthquakes. Figures, examples, problems, and computer exercises teach students about seismology in a creative and intuitive manner. Necessary mathematical tools including vector and tensor analysis, matrix algebra, Fourier analysis, statistics of errors, signal processing, and data inversion are introduced with many relevant examples. The text also addresses the fundamentals of seismometry and applications of seismology to societal issues. Special attention is paid to help students visualize connections between different topics and view seismology as an integrated science. An Introduction to Seismology, Earthquakes, and Earth Structure gives an excellent overview for students of geophysics and tectonics, and provides a strong foundation for further studies in seismology. Multidisciplinary examples throughout the text - catering to students in varied disciplines (geology, mineralogy, petrology, physics, etc.). Most up to date book on the market - includes recent seismic events such as the 1999 Earthquakes in Turkey, Greece, and Taiwan). Chapter outlines - each chapter begins with an outline and a list of learning objectives to help students focus and study. Essential math review - an entire section reviews the essential math needed to understand seismology. This can be covered in class or left to students to review as needed. End of chapter problem sets - homework problems that cover the material presented in the chapter. Solutions to all odd numbered problem sets are listed in the back so that students can track their progress. Extensive References - classic references and more current references are listed at the end of each chapter. A set of instructor's resources containing downloadable versions of all the figures in the book, errata and answers to homework problems is available at: <http://levee.wustl.edu/seismology/book/>. Also available on this website are PowerPoint lecture slides corresponding to the first 5 chapters of the book.

Earthquake Engineering for Structural Design

Seismology in the Plate Tectonics Revolution

Global Tectonics

Active Tectonics and Seismic Potential of Alaska

Seismology in the Plate Tectonics Revolution : the Story of Earthquakes and the Great Earth Science Revolution of the 1960s

The San Andreas Fault System, California