

Geophysics A Very Short Introduction Very Short In

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[Anthropocene: A Very Short Introduction](#) Academic Press

This second edition of *Fundamentals of Geophysics* has been completely revised and updated, and is the ideal geophysics textbook for undergraduate students of geoscience with an introductory level of knowledge in physics and mathematics. It gives a comprehensive treatment of the fundamental principles of each major branch of geophysics, and presents geophysics within the wider context of plate tectonics, geodynamics and planetary science. Basic principles are explained with the aid of numerous figures and step-by-step mathematical treatments, and important geophysical results are illustrated with examples from the scientific literature. Text-boxes are used for auxiliary explanations and to handle topics of interest for more advanced students. This new edition also includes review questions at the end of each chapter to help assess the reader's understanding of the topics covered and quantitative exercises for more thorough evaluation. Solutions to the exercises and electronic copies of the figures are available at www.cambridge.org/9780521859028.

[Astrophysics: A Very Short Introduction](#) Oxford University Press

Physics, the fundamental science of matter and energy, encompasses all levels of nature from the subatomic to the

cosmic, and underlies much of the technology around us.

Understanding the physics of our universe is an essential aspect of humanity's quest to understand our environment and our place within it. Doing physics enables us to explore the interaction between environment and human society, and can help us to work towards the future sustainability of the planet. This Very Short Introduction provides an overview of how this pervasive science came to be and how it works: who funds it, how physicists are trained and how they think, and how physics supports the technology we all use. Sidney Perkowitz presents the theories and outcomes of pure and applied physics from ideas of the Greek natural philosophers to modern quantum mechanics, cosmology, digital electronics and energy production.

Considering its most consequential experiments, including recent results in elementary particles, gravitational waves and materials science, he also discusses outside the lab, the effects of physics on society, culture, and humanity's vision of its place in the universe. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

[Introducing Geophysics](#) Oxford University Press

Soft Matter science is concerned with soft materials such as polymers, colloids, liquid crystals, and foams, and has emerged as a rich interdisciplinary field over the last 30 years. Drawing on physics, chemistry, mathematics and engineering, soft matter links fundamental scientific ideas to everyday phenomena. One such example is 'polymers', encountered in plastic materials and melted cheese, which illustrate how 'sliminess' emerges from the flow and form of giant molecules. This Very Short Introduction delves into the field of soft matter, looking beneath the appearances of matter into its inner

structure. Tom McLeish shows how Brownian Motion - the random local motion of molecules that gives rise to 'heat' - is an underlying principle of soft matter. From hair conditioner to honey, he discusses how the shared physical properties and characteristics of these materials influence the way they behave, and their industrial applications. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

[Water: A Very Short Introduction](#) OUP Oxford

1. What is geophysics? -- 2. Planet Earth -- 3. Seismology and the Earth's internal structure -- 4. Siesmicity--the restless Earth -- 5. Gravity and the figure of the Earth -- 6. The Earth's heat -- 7. The Earth's magnetic field -- 8.

Afterthoughts

[Biogeography: A Very Short Introduction](#) Oxford University Press, USA

There is something for every subsurface professional in these fifty-two short essays by more than three dozen petroleum geoscientists. The roster includes some of the most prolific geophysicists of our time, as well as some recently qualified scientists. The topics are even more diverse, ranging from anisotropic media to pre-stack interpretation, and from stories of early seismic workstations to career advice for the future.

[Geophysics](#) Oxford University Press

The atmosphere is the thin, diffuse fluid that envelops the Earth's surface. Despite its apparent fragility, the existence of this fluid is vital for human and other life on Earth. In this Very Short Introduction Paul Palmer describes the physical and chemical characteristics of different layers in the atmosphere, and shows how the interactions where the atmosphere is in contact with land, ocean, and ice affect its observed physical and chemical properties. He also looks at how movement in

the atmosphere, driven by heat from the sun, transports heat from lower latitudes to higher latitudes, and is a fundamental feature of the general circulation in the atmosphere. Finally, Palmer presents an overview of the types of measurements used to understand different parts of the atmosphere, and identifies the future challenges for atmospheric scientists.

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[Chemistry: A Very Short Introduction](#) Oxford University Press

Following the increasing cost of fossil fuels and concerns about the security of their future supply. However, the term 'nuclear power' causes anxiety in many people and there is confusion concerning the nature and extent of the associated risks.

[Statistics: A Very Short Introduction](#) Oxford University Press

Minerals existed long before any forms of life, playing a key role in the origin and evolution of life; an interaction with biological systems that we are only now beginning to understand. Exploring the traditional strand of mineralogy, which emphasises the important mineral families, the well-established analytical methods (optical microscopy and X-ray diffraction) and the dramatic developments made in techniques over recent decades, David Vaughan also introduces the modern strand of mineralogy, which explores the role minerals play in the plate tectonic cycle and how they interact with the living world. Demonstrating how minerals can be critical for human health and illness by providing essential nutrients and releasing poisons, Vaughan explores the multitude of ways in which minerals have aided our understanding of the world.

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Waves: A Very Short Introduction Oxford University Press

Water dominates the surface of Earth and is vital to life on our planet. It is a remarkable liquid which shows anomalous behaviour. In this Very Short Introduction John Finney introduces the science of water, and explores how the structure of water molecules gives rise to its physical and chemical properties. Considering water in all three of its states as ice and steam as well as liquid, Finney explains the great importance of an understanding of its structure and behaviour to a range of fields including chemistry, astrophysics, and earth and environmental sciences. Finney describes the role of water in biology, and ends with a discussion of the outstanding controversies concerning water, and some of the 'magical' properties which have been claimed for it.

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[Soft Matter: A Very Short Introduction](#) Oxford University Press

The advent of accessible student computing packages has meant that geophysics students can now easily manipulate datasets and gain first-hand modeling experience - essential in developing an intuitive understanding of the physics of the Earth. Yet to gain a more in-depth understanding of physical theory, and to develop new models and solutions, it is necessary to be able to derive the relevant equations from first principles. This compact, handy book fills a gap left by most modern geophysics textbooks, which generally do not have space to derive all of the important formulae, showing the intermediate steps. This guide presents full derivations for the classical equations of gravitation, gravity, tides, earth rotation, heat, geomagnetism and foundational seismology, illustrated with simple schematic diagrams. It supports students through the successive steps and explains the logical sequence of a derivation - facilitating self-study and helping students to tackle homework exercises and prepare for exams.

[Nuclear Power: A Very Short Introduction](#) OUP Oxford

For generations, the ground beneath the feet of our ancestors seemed solid and unchanging. Around 30 years ago, two things happened that were to revolutionize the understanding of our home planet. First, geologists realized that the continents themselves were drifting across the surface of the globe and that oceans were being created and destroyed. Secondly, pictures of the entire planet were returned from space. As the astronomer Fred Hoyle had predicted, this 'let loose an idea as powerful as any in history'. Suddenly, the Earth began to be viewed as a single entity; a dynamic, interacting whole, controlled by complex processes we scarcely understood. It began to seem less solid. As one astronaut put it, 'a blue jewel on black velvet; small, fragile and touchingly alone'. Geologists at last were able to see the whole as well as the detail; the wood as well as the trees. This book brings their account up to date with the latest understanding of the processes that govern our planet.

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[Geology: A Very Short Introduction](#) Dunedin Academic Press Ltd

When humanity first glimpsed planet Earth from space, the unity of the system that supports humankind entered the popular consciousness. The concept of the Earth's atmosphere, biosphere, oceans, soil, and rocks operating as a closely interacting system has rapidly gained ground in science. This new field, involving geographers, geologists, biologists, oceanographers, and atmospheric physicists, is known as Earth System Science. In this Very Short Introduction, Tim Lenton considers how a world in which humans could evolve was created; how, as a species, we are now reshaping that world; and what a sustainable future for humanity within the Earth System might look like. Drawing on elements of geology, biology, chemistry, physics, and mathematics, Lenton asks whether Earth System Science can help guide us onto a sustainable course before we alter the Earth system to the point where we destroy ourselves and our current civilisation.

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sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

52 Things You Should Know about Geophysics OUP Oxford
Gravity is one of the four fundamental interactions that exist in nature. It also has the distinction of being the oldest, weakest, and most difficult force to quantize. Understanding gravity is not only essential for understanding the motion of objects on Earth, but also the motion of all celestial objects, and even the expansion of the Universe itself. It was the study of gravity that led Einstein to his profound realisations about the nature of space and time. Gravity is not only universal, it is also essential for understanding the behaviour of the Universe, and all astrophysical bodies within it. In this Very Short Introduction Timothy Clifton looks at the development of our understanding of gravity since the early observations of Kepler and Newtonian theory. He discusses Einstein's theory of gravity, which now supplants Newton's, showing how it allows us to understand why the frequency of light changes as it passes through a gravitational field, why GPS satellites need their clocks corrected as they orbit the Earth, and why the orbits of distant neutron stars speed up. Today, almost 100 years after Einstein published his theory of gravity, we have even detected the waves of gravitational radiation that he predicted. Clifton concludes by considering the testing and application of general relativity in astrophysics and cosmology, and looks at dark energy and efforts such as string theory to combine gravity with quantum mechanics. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Philosophy of Physics: A Very Short Introduction Oxford University Press

Proving to be both varied and fascinating, moons are far more common than planets in our Solar System. Our own Moon has had a profound influence on Earth, not only through tidal effects, but even on the behaviour of some marine animals. Many remarkable things have been discovered about the moons of the giant outer planets from Voyager, Galileo, Cassini, and other spacecraft. Scientists have glimpsed volcanic activity on Io, found oceans of water on Titan, and captured photos of icy geysers bursting from Enceladus. It looks likely that microbial life beyond the Earth may be discovered on a

moon rather than a planet. In this Very Short Introduction David Rothery introduces the reader to the moons of our Solar System, beginning with the early discoveries of Galileo and others, describing their variety of mostly mythological names, and the early use of Jupiter's moons to establish position at sea and to estimate the speed of light. Rothery discusses the structure, formation, and influence of our Moon, and those of the other planets, and ends with the recent discovery of moons orbiting asteroids, whilst looking forward to the possibility of finding moons of exoplanets in planetary systems far beyond our own. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Landscapes and Geomorphology: A Very Short Introduction Oxford University Press

Most people remember chemistry from their schooldays as largely incomprehensible, a subject that was fact-rich but understanding-poor, smelly, and so far removed from the real world of events and pleasures that there seemed little point, except for the most introverted, in coming to terms with its grubby concepts, spells, recipes, and rules. Peter Atkins wants to change all that. In this Very Short Introduction to Chemistry, he encourages us to look at chemistry anew, through a chemist's eyes, in order to understand its central concepts and to see how it contributes not only towards our material comfort, but also to human culture. Atkins shows how chemistry provides the infrastructure of our world, through the chemical industry, the fuels of heating, power generation, and transport, as well as the fabrics of our clothing and furnishings. By considering the remarkable achievements that chemistry has made, and examining its place between both physics and biology, Atkins presents a fascinating, clear, and rigorous exploration of the world of chemistry - its structure, core concepts, and exciting contributions to new cutting-edge technologies. ABOUT THE SERIES: The Very Short Introductions series from

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Plate Tectonics: A Very Short Introduction Oxford University Press

Very Short Introductions: Brilliant, Sharp, Inspiring
Philosophy of physics is concerned with the deepest theories of modern physics - notably quantum theory, our theories of space, time and symmetry, and thermal physics - and their strange, even bizarre conceptual implications. A deeper understanding of these theories helps both physics, through pointing the way to new theories and new applications, and philosophy, through seeing how our worldview has to change in the light of what we learn from physics. This Very Short Introduction explores the core topics in philosophy of physics through three key themes. The first - the nature of space, time, and motion - begins by considering the philosophical puzzles that led Isaac Newton to propose the existence of absolute space, and then discusses how those puzzles change - but do not disappear - in the context of the revolutions in our understanding of space and time that came first from special, and then from general, relativity. The second - the emergence of irreversible behavior in statistical mechanics - considers how the microscopic laws of physics, which know of no distinction between past and future, can be compatible with the melting of ice, the cooling of coffee, the passing of youth, and all the other ways in which the large-scale world distinguishes past from future. The last section discusses quantum theory - the foundation of most of modern physics, yet mysterious to this day. It explains just why quantum theory is so difficult to make sense of, how we might nonetheless attempt to do it, and why the question has been highly relevant to the development of physics, and continues to be so. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Physics: A Very Short Introduction Cambridge University Press

The Sun, as our nearest star, is of enormous importance for life on Earth - providing the warm radiation and light which allowed complex life to evolve. The Sun plays a key role in influencing our climate, whilst solar storms and high-energy events can threaten our communication infrastructure and

satellites. This Very Short Introduction explores what we know about the Sun, its physics, its structure, origins, and future evolution. Philip Judge explains some of the remaining puzzles about the Sun that still confound us, using elementary physics, and mathematical concepts. Why does the Sun form spots? Why does it flare? As he shows, these and other nagging difficulties relate to the Sun's continually variable magnetism, which converts an otherwise dull star into a machine for flooding interplanetary space with variable radiation, high-energy particles and magnetic ejections. Throughout, Judge highlights the many reasons that the Sun is important, and why scientists engage in solar research. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Time: A Very Short Introduction Oxford University Press
The importance of the oceans to life on Earth cannot be overstated. Liquid water covers more than 70% of our planet's surface and, in past geological time, has spread over 85%. Life on Earth began in the oceans over 3.5 billion years ago and remained there for the great majority of that time. Today the seas still provide 99% of habitable living space, the largest repository of biomass, and holds the greatest number of undiscovered species on the planet. Our oceans are vital for the regulation of climate, and with global warming and decreasing land area, they have become increasingly important as the source of food, energy in the form of oil and gas, and for their mineral wealth. Oceans also form a key part of the biogeochemical cycles of carbon, nitrogen, and other elements critical to life. Nutrients in upwelling areas are spread by ocean currents, and the plankton of the seas supports a wealth of wildlife. In this Very Short Introduction Dorrik Stow analyses these most important components of our blue planet and considers their relationship with, and exploitation by, humans. He shows how the oceans are an essential resource to our overpopulated world, and discusses why exploration and greater scientific understanding of the oceans, their chemistry, and their mineral wealth are now a high priority.

Stow also explores what we know of how oceans originate, and evolve and change; the shape of the seafloor and nature of its cover; the physical processes that stir the waters and mix such a rich chemical broth; and the inseparable link between oceans and climate. As polar ice melts and sea-levels rise, countless millions who have made their homes on low-lying lands close to the sea are threatened. As scientific exploration of the seas gathers pace, the new knowledge gained of the ocean-Earth systems and their interaction with the human environment is vital to our understanding of how we can preserve these ultimately fragile environments. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Plate Tectonics: A Very Short Introduction OUP Oxford

This revised text presents a cogent explanation of the fundamentals of meteorology, and explains storm dynamics for weather-oriented meteorologists. It discusses climate dynamics and the implications posed for global change. The Fourth Edition features a CD-ROM with MATLAB® exercises and updated treatments of several key topics. Much of the material is based on a two-term course for seniors majoring in atmospheric sciences. * Provides clear physical explanations of key dynamical principles * Contains a wealth of illustrations to elucidate text and equations, plus end-of-chapter problems * Holton is one of the leading authorities in contemporary meteorology, and well known for his clear writing style * Instructor's Manual available to adopters NEW IN THIS EDITION * A CD-ROM with MATLAB® exercises and demonstrations * Updated treatments on climate dynamics, tropical meteorology, middle atmosphere dynamics, and numerical prediction

Nothing: A Very Short Introduction OUP Oxford

"In this new edition Samir Ikasha reviews the main themes of contemporary philosophy of science. Beginning with a brief account of the history of modern science, he asks whether there is a discernible pattern to the way scientific ideas change over time. He examines scientific inference,

scientific explanation, and the debate between realist and anti-realist views of science."--