The Antarctic: A Very Short Introduction
Klaus Dodds

Antarctic: A Very Short Introduction provides a modern account of Antarctica, highlighting the main issues facing the continent today, looks at how the Antarctic has been explored and represented, and considers the main exploratory and scientific achievements of the region. How has globalization impacted on the Antarctic's current and future status? The Antarctic is one the most hostile natural environments in the world. It is an extraordinary physical space, which changes significantly in shape and size with the passing of the seasons. Politically, it is interesting as it contains one of the few areas of continental space not claimed by any nation-state. Scientifically, the continental ice sheet has provided us with vital evidence about the Earth's past climate.

Anthropocene: A Very Short Introduction
Erle C. Ellis

Humanity’s impact on the planet has been profound. From fire, intensive hunting, and agriculture, it has accelerated into rapid climate change, widespread pollution, plastic accumulation, species invasions, and the mass extinction of species—changes that have left a permanent mark in the geological record of the rocks. Yet the proposal for a new unit of geological time—the Anthropocene Epoch—has raised debate far beyond the scientific community. The Anthropocene has emerged as a powerful new narrative of the relationship between humans and nature. Anthropocene: A Very Short Introduction draws on the work of geologists, geographers, environmental scientists, archaeologists, and humanities scholars to explain the science and wider implications of the Anthropocene.

Astrobiology: A Very Short Introduction
David C. Catling

Humanity’s impact on the planet has been profound. From fire, intensive hunting, and agriculture, it has accelerated into rapid climate change, widespread pollution, plastic accumulation, species invasions, and the mass extinction of species—changes that have left a permanent mark in the geological record of the rocks. Yet the proposal for a new unit of geological time—the Anthropocene Epoch—has raised debate far beyond the scientific community. The Anthropocene has emerged as a powerful new narrative of the relationship between humans and nature. Anthropocene: A Very Short Introduction draws on the work of geologists, geographers, environmental scientists, archaeologists, and humanities scholars to explain the science and wider implications of the Anthropocene.
What fascinates people about astrobiology is that it seeks answers to long-standing unsolved questions: How quickly did life evolve on Earth and why did life persist here? Is there life elsewhere in the Solar System or beyond? Astrobiology: A Very Short Introduction explores some of the big unanswered questions about the universe, considers the origins of life on Earth and its evolution, and brings together the ideas of microbiologists, astronomers, planetary scientists, and geologists. It introduces the origins of astrobiology and demonstrates its impact on current astronomical research and potential future discoveries.

The Atmosphere: A Very Short Introduction
Paul I. Palmer

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. The Atmosphere: A Very Short Introduction describes the physical and chemical characteristics of different layers in the atmosphere, and shows how the atmosphere’s interactions with land, ocean, and ice affect these properties. It also looks at how movement in the atmosphere, driven by heat from the Sun, transports heat from lower latitudes to higher latitudes. Finally, it presents an overview of the types of measurements used to understand different parts of the atmosphere, and identifies future challenges in the light of climate change.

Climate: A Very Short Introduction
Mark Maslin

Climate: A Very Short Introduction considers all aspects of the global climate system, exploring and explaining the different components that control the climate on Earth. Climate affects everything we do in life, from the clothes we wear to the illnesses we might catch. How does energy reach the Earth? How does the ocean–atmosphere system redistribute energy around the plane? What is the relationship and what are the differences between climate and the weather? Climate affects life on Earth and human settlements in many different ways. Humans have to live their lives aware of the risk of cyclic and quasi-cyclic features of climate such as the Milankovitch cycles and El Nino.
Deserts: A Very Short Introduction
Nick Middleton

Deserts: A Very Short Introduction explores the nature of deserts and the extent of their variety, climates, landscapes, wildlife, and human habitation. Typified by drought and extremes of temperature, deserts can be harsh and hostile; but many are also beautiful and, on occasion, teem with life. The uniqueness of deserts through an examination of their plants, animals, climatic conditions, scenery, resources, human occupants, and future potential are outlined. The beauty, biodiversity, and importance of deserts within a global context are highlighted and a case made for their preservation, protection, and further research.

Dinosaurs: A Very Short Introduction
David Norman

Dinosaurs: A Very Short Introduction discusses how dinosaurs were first discovered and interpreted, and how our understanding of them has changed over the past 200 years. It looks at some of the amazing discoveries that have enabled us to gain new and unexpected insights into dinosaurs as animals with natural histories and behaviours, and considers some of the biggest questions in dinosaur biology, such as the implications of their having warm blood. It also shows how research on dinosaurs has been enriched, particularly in recent decades, by technological break-throughs which complement the informed speculation and luck that have played a part in many of the major discoveries.

The Earth: A Very Short Introduction
Martin Redfern

The Earth: A Very Short Introduction provides an introduction to the processes that govern the changing geology of the Earth. About 30 years ago, two things happened that began to revolutionize the understanding of these processes. First, geologists realized that the continents themselves were drifting across the surface of the globe and that the oceans were being created and destroyed. Secondly, satellites in space returned images of the entire planet and Earth began to be viewed as a single, dynamic entity. This VSI looks at how those ideas have transformed our understanding of the geological processes that are at work on our planet.
Earth System Science: A Very Short Introduction
Tim Lenton

The concept of the Earth’s atmosphere, biosphere, oceans, soil, and rocks operating as a closely interacting system has rapidly gained ground in science. Earth System Science: A Very Short Introduction considers how a world in which humans could evolve arose; 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, it asks whether Earth system science can help guide us on to a sustainable course before we alter the Earth system to the point where we destroy ourselves and our current civilization.

Fire: A Very Short Introduction
Andrew C. Scott

Fire: A Very Short Introduction considers fire’s four-hundred-million-year history, its chemical composition, its role in human development, and its different meanings, from heat and comfort to death and destruction. Fires in buildings regularly make the headlines, and news of wildfires now reaches our computer and smartphone screens. Urban and pastoral attitudes to fire can differ and formulating fire suppression policies can be complex. Two things have fundamentally altered our understanding: increased knowledge about fire in the deep time before human evolution, and the growth of satellite technology, which has transformed how we observe fire. In the context of our changing climate, an improved understanding of fire worldwide is urgently needed.

Fossils: A Very Short Introduction
Keith Thomson

How did Darwin use fossils to support his theory of evolution? What are ‘living fossils’? What fossils will we leave behind for future generations to examine? Fossils: A Very Short Introduction shows how fossils have been vital to our understanding of the formation of the earth and the origins of all life on it. However, their impact has not been limited to debates about geology and evolution; attempts to explain their existence has shaken religion at its very roots, and they have remained a subject of ceaseless fascination for people of all ages and backgrounds.
Geography: A Very Short Introduction
John A. Matthews and David T. Herbert

Geography: A Very Short Introduction charts modern geography's development from its historical roots in exploring foreign lands and mapping the regions of the world. Spanning both physical and human geography, the discipline today is unique as a subject which can bridge the divide between the sciences and the humanities, and between the environment and our society. Using wide-ranging examples from global warming and oil, to urbanization and ethnicity, this Very Short Introduction paints a broad picture of the current state of geography, its subject matter, concepts and methods, and its strengths and controversies.

Geology: A Very Short Introduction
Jan Zalasiewicz

Geology: A Very Short Introduction provides a concise introduction to the fascinating field of geology. Describing how the science began, it looks at the key discoveries that have transformed it, before delving into the modern science and its various subfields, such as sedimentology, tectonics, and stratigraphy. Analysing the geological foundations of the Earth, this VSI explains the interlocking studies of tectonics, geophysics, igneous and metamorphic petrology, and geochemistry and describes the geology of both the deep interior and surface of the Earth. Considering the role and importance of geology in the finding and exploitation of resources, it also discusses its place in environmental issues and in tackling problems associated with climate change.

Geophysics: A Very Short Introduction
William Lowrie

Geophysics is the physics of the Earth. It encompasses areas such as seismology, plate tectonics, gravity, and the Earth’s magnetic field, all of which give clues to both the structure and the working of the Earth. Geophysics: A Very Short Introduction describes the internal and external processes that affect the planet, as well as the techniques used by geophysicists to investigate them. It explains how analysis of the seismic waves produced in earthquakes reveals the Earth’s internal structure, and tells how heat is transported through its interior. Chapters describe how satellite missions measure the gravity and magnetic...
fields, and explain how its magnetic field shields the Earth against harmful radiation from the Sun and outer space.

**Glaciation: A Very Short Introduction**

David J. A. Evans

Vast, majestic, and often stunningly beautiful, glaciers lock up some 10 per cent of the world’s fresh water. These great bodies of ice play an important part in the Earth system, carving landscapes and influencing climate on regional and hemispheric scales, as well as having a significant impact on global sea level. Glaciation: A Very Short Introduction offers an overview of glaciers and ice sheets as systems, considering the role of geomorphology and sedimentology in studying them, and their impacts on our planet in terms of erosional and depositional processes. Looking at our glaciers today, and their ongoing processes, it considers the extent to which we can use this knowledge in reconstructing and interpreting ancient glacial landscapes.

**The History of Life: A Very Short Introduction**

Michael J. Benton

The History of Life: A Very Short Introduction introduces ideas from a range of scientific disciplines, from evolutionary biology and earth history, to geochemistry, palaeontology, and systematics, to present a succinct guide to the key episodes in the evolution of life — from the very origins of life four million years ago to the extraordinary diversity of species around the globe today. Major breakthroughs that made new forms of life possible: including sex and multicellularity, hard skeletons, and the move to land are described along with mass extinctions, the first forests, the rise of modern ecosystems, and conscious humans.

**The Ice Age: A Very Short Introduction**

Jamie Woodward

The study of the Quaternary ice age has revolutionized ideas about Earth system change and the pace of landscape and ecosystem dynamics. The Ice Age: A Very Short Introduction looks at evidence from the continents, the oceans, and the ice core records, and the human stories behind it all. It examines the remarkable environmental shifts that took place during
the Great Ice Age of the Quaternary Period. This VSI explores the evolution of ideas, evaluates the contributions of the leading players in the great debates, and presents some of the ingenious methods that have been used to retrieve information about the recent geological past.

Isotopes: A Very Short Introduction
Rob Ellam

An isotope is a variant form of a chemical element, containing a different number of neutrons in its nucleus. Most elements exist as several isotopes. Many are stable, others are radioactive, and some may only exist fleetingly before decaying into other elements. The study of isotope ratios has become central to many areas of science, and used to probe the age and history of the Earth and the origins of the Solar System. Radioactive isotopes find wide applications, from nuclear power to medicine and carbon dating. Isotopes: A Very Short Introduction provides an overview of the nature of stable and radioactive isotopes, considering their wide range of modern applications.

Lakes: A Very Short Introduction
Warwick F. Vincent

From the mysterious depths of Lake Vostok, Antarctica, to tropical floodplain lakes, inland seas, hydro-reservoirs, and numerous waterbodies in our local environment, lakes encompass a huge diversity of shapes, sizes, depths, colours, and even salinities. Lakes are important, unique ecosystems, providing us with drinking water and food. Lakes: A Very Short Introduction introduces lake science (‘limnology’), discussing the importance of sustaining these complex ecosystems; and the impact on lake biodiversity of features such as climate, seasons, salinity, and sedimentation. It traces the origins of lake science from François Forel’s seminal work on Lake Geneva to modern approaches, such as environmental sensors, satellite observations, stable isotope analysis, and DNA-based technologies.

Landscapes and Geomorphology: A Very Short Introduction
Andrew Goudie and Heather Viles
Landscapes and Geomorphology: A Very Short Introduction presents an introduction to landscapes and the methods and techniques used to study it. Examining what landscapes are, and how we use a range of ideas and techniques to study them, it is demonstrated how geomorphologists have built on methods pioneered by 19th-century scientists. Using examples from around the world, key controls on landscapes today, such as tectonics, climate, humans, and the living world, are explored. Concluding with the cultural importance of landscapes, and how this has led to the conservation of much 'earth heritage', this VSI looks at how we can predict the response of landscapes to climate change in the future.