NEW BOOKS

Our Threatened Oceans
Stefan Rahmstorf and Katherine Richardson
Haas Publishing
London SW1X 9AH England
2009. 260 pages. US$ 14.95
ISBN 978-1-906598-06-8

This book is part of The Sustainability Project, a series of 12 volumes focusing on the challenges of global sustainable development. The authors provide a concise introduction to physical oceanography and the biodiversity of oceans, along with an extensive discussion of various global element cycles important in maintaining the health of the oceans. The goal of the book is to demonstrate how we can protect ocean ecosystems.

Contents:
- Oceans and Their Role in the Global Climate
- Life in the Oceans
- Global Element Cycles
- Climate Change and the Oceans
- Changes to the Element Cycles
- Changes to Life in the Ocean
- The Ocean as a Waste Receptacle
- Other Human Uses of the Ocean
- Visions of the Future

The authors provide a concise introduction to physical oceanography and the biodiversity of oceans. Two major themes running throughout this book are the interactions between humans and the ocean—we are the primary reason the oceans are threatened—and the oceans’ primary role in regulating the global climate system. The book ends with both dark and bright visions of the future, depending on how humans decide to interact with our oceans. This work is suitable for the average reader interested in global climate change and the future of the oceans. . . . Recommended.

Schimmrich SH: Choice 47, no. 7 (March 2010): 1316.

Over the Coasts: An Aerial View of Geology
Michael Collier
Mikawa Press
12 Bedford Street
New York, New York 10014 USA
2009. 120 pages. US$ 34.95

In both words and images, aerial photographer and geologist Michael Collier chronicles changes—many due to human impacts—that have occurred along North American coasts: the Atlantic, the Pacific, the Great Lakes and the Gulf of Mexico. Also included are spot maps, an overview map and glossary.

Contents:
- Introduction
- Poetry of Water, Dance of Sand
- Coasting Around the Continent: Gulf of Mexico; Southern Atlantic; Northern Atlantic; Great Lakes; Pacific; Alaska
- The Human Presence
- A Solace of Wings
- Photo Locations
- Glossary, Recommended Reading, Acknowledgements, Index

While the topics are sufficiently complex to challenge a sophisticated reader, the lucid writing, anecdotal style, and exceptional illustrations will invite the interest of a wider audience. . . . Highly recommended.

Davis RM: Choice 47, no. 7 (March 2010): 1303.

Nanoscale: Visualizing an Invisible World
Kenneth S. Deffeyes and Stephen E. Deffeyes
The MIT Press
55 Hayward Street
Cambridge, Massachusetts 02142 USA
2009. 153 pages. US$ 22.95

Based in large part on X-ray crystallography, this book examines various molecular structures smaller than a nanometer in diameter. Each subject was chosen because it illustrates how atomic structure creates a property (such as hardness, color or toxicity), because it has a great story, or simply because it is beautiful.

Contents:
- Air
- Ice and Water Vapor
- Gold
- Chemical Bonds
- Sodium Chloride
- Diamond
- Hexagonal Diamond
- Nanotubes and Buckyballs
- Asbestos
- Pyroxene
- Alloys
- Phosphate
- Alpha Helix and Beta Sheet
- Lysozime
- Drugs
- Hemoglobin
- Chlorophyll
- Urease
- Lipid Membrane
- Rod Virus
- Icosahedra Virus
- Unit Cell Discovery
- Twinned Crystals
- Calcite Twinning
- Calcite Twin Plane
- Dolomite Twin Plane
- Quartz
- Close-Packed Metals
- Screw Dislocation
- Erionite
- Faujasite
- Lubricants
- Montmorillonite
- Perovskite Morph
- Perovskite Superconductor
- Silicon Diode
- Fuel Cell
- Laser Crystals
- Supercapacitor
- Epitaxial Growth
- Memristor
- Ferromagnetism
- Rare Earth Magnets
- Flash Memory
- Metallic Glass
- Spinodal Decomposition
- Diamantane
- Penrose Tiling
- Penrose Diffraction
- Quasicrystal
- Notes

[A] thoughtful, playful tour through the nano-scale world . . . . the 50 cameo explanations are clear and vivid, often with surprising details and amusing touches of humanity. . . . Surprisingly engaging, this collection of short lessons in molecular science is a fun, informative way to get lost in inner space.

Introductory Mathematics for Earth Scientists
Xin-She Yang
Dunedin Academic Press
Hudson House
8 Albany Street
Edinburgh EH1 3QB Scotland
2009. 228 pages. US$ 25.50
ISBN 190-671600-5

The book comprises 14 chapters, many including case studies to illustrate fundamental mathematical knowledge as applied in various scientific processes. The topics covered include binomial theorem, index notations, polynomials, sequences and series, trigonometry, spherical trigonometry, ordinary differential equations, partial differential equations, Fourier transforms, numerical methods and geostatistics.

Contents:
- Preface
- Preliminary Mathematics I
- Preliminary Mathematics II
- Binomial Theorem and Sequences
- Trigonometry and Spherical Trigonometry
- Complex Numbers
- Differentiation
- Integration
- Fourier Transforms
- Vectors
- Matrix Algebra
- Ordinary Differential Equations
- Partial Differential Equations
- Geostatistics
- Bibliography, Glossary, Mathematical Formulas, Epilogue, Index

In this book, Yang provides an introduction to the fundamental mathematics that all Earth scientists should attain. The book is self-contained and provides an essential toolkit of basic mathematics. . . . Even though the book has been designed to offer good introduction to nonmathematicians and freshmman geoscientists, it can also be used as a quick reference book for refreshing elementary mathematical concepts commonly used in Earth sciences by experienced geoscientists.

Vesuvius: A Biography
Alwyn Scarth
Princeton University Press
41 William Street
Princeton, New Jersey 08540 USA
2009. 352 pages. US$ 29.95

This book chronicles the eruptions of Mount Vesuvius along with a discussion of the scientific, historical and cultural impacts of these eruptions. Also included are its effects on daily living, recreation, commerce, art and religion.

Contents:
- Introduction
- Campanian Volcanoes: In the Beginning
- The Averillo Eruption: A Prelude to Pompeii
- The Eruption in AD 79: The Day of Wrath
- From Antiquity to the Renaissance: Tall Stories
- The Eruption of Monte Nuovo: A New Approach
- The Eruption in 1631: The Counter Reformation
- The Old Cities Rediscovered: Antiquity Protected
- Hamilton and Vesuvius: Volcano-Watching
- Vesuvius as a Tourist Attraction: The Grand Tour
- Persistent Activity, 1822–1944: Scientific Scrutiny
- The Campi Flegrei: An Eruption That Failed
- The Future: The Eruption to Be Avoided
- Appendices, Bibliography, Index

In this book, Scarth provides an introduction to the fundamental mathematics that all Earth scientists should attain. The book is self-contained and provides an essential toolkit of basic mathematics. . . . Even though the book has been designed to offer good introduction to nonmathematicians and freshmman geoscientists, it can also be used as a quick reference book for refreshing elementary mathematical concepts commonly used in Earth sciences by experienced geoscientists.

Now and again a book appears that offers a different perspective on volcanic eruptions. Alwyn Scarth’s Vesuvius: A Biography is one such book, and it takes the reader on a fascinating journey through Vesuvius’ history seen through the eyes of the people who witnessed the eruptions and who were often directly affected by them. . . . A gripping book.


Principles of Igneous and Metamorphic Petrology, 2nd edition
Anthony R. Philpotts and Jay J. Ague
Cambridge University Press
32 Avenue of the Americas
New York, New York 10013 USA
2009. 686 pages. US$ 90.00
ISBN 978-0-521-88006-0

This textbook provides a basic understanding of the formative processes of igneous and metamorphic rock. With more than 350 illustrations, this revised edition contains much new material on the structure and composition of rocks and their behavior in nature. This is enhanced by the integration of research-based information from journals. . . . The text is complemented by crisp, clear diagrams and photographs, including some taken from publications.

Contents:
- Introduction
- Physical Properties of Magma
- Intrusion of Magma
- Forms of Igneous Bodies
- Cooling of Igneous Bodies and Other Diffusion Processes
- Classification of Igneous Rocks
- Introduction to Thermodynamics
- Free Energy and Phase Equilibria
- Thermodynamics of Solutions
- Equilibrium in Igneous Systems
- Effects of Volatiles on Melt Equilibria
- Crystal Growth
- Isotope Geochemistry Related to Petrology
- Magmatic Processes
- Igneous Rock Associations
- Metamorphism and Metamorphic Facies
- Deformation and Textures of Metamorphic Rocks
- Graphical Analysis of Metamorphic Mineral Assemblages
- Geothermometry, Geobarometry, and Mineral Reactions Among Solid Solutions
- Mineral Reactions Involving H2O and CO2
- Material Transport During Metamorphism
- Pressure–Temperature–Time Paths and Heat Transfer During Metamorphism
- Origin of Rocks
- Answers to Selected Numerical Problems, References, Index

Maps, photographs, and an extensive bibliography augment the stories. Vesuvius is unmatched for its integration of the scientific, historical, and cultural aspects of a world-famous volcano that must be reckoned with. . . . Highly recommended.

Grose TLT, Claver 47, no. 7 (March 2010): 1316.

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