

# KEY TITLES IN PETROLEUM & GEOSCIENCE

## The Imperial College Lectures in PETROLEUM ENGINEERING SERIES

### The Imperial College Lectures in PETROLEUM ENGINEERING

An Introduction to  
Petroleum Geoscience

by **Michael Ala** (Imperial College London, UK)

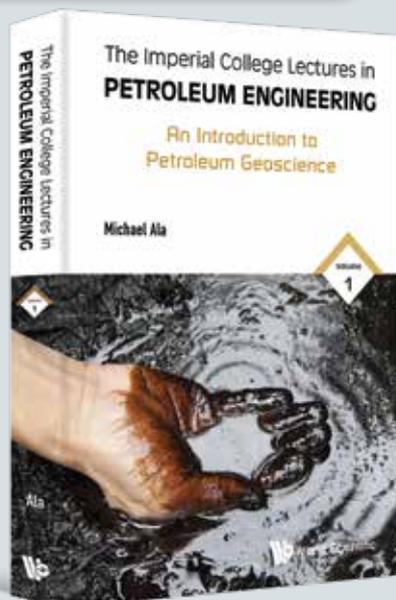
### The Imperial College Lectures in PETROLEUM ENGINEERING

Reservoir Engineering

by **Martin J Blunt** (Imperial College London, UK)

This volume also includes an introduction to the series by Martin Blunt and Alain Gringarten, of Imperial College, London.

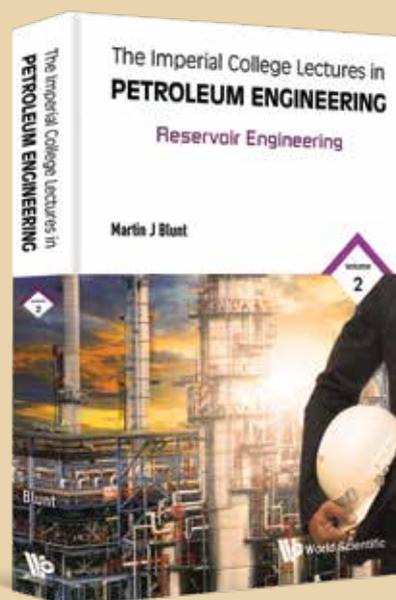
Volume  
1



This book covers the fundamentals of the earth sciences and examines their role in controlling the global occurrence and distribution of hydrocarbon resources. It explains the principles, practices and the terminology associated with the upstream sector of the oil industry. Key topics include a look at the elements and processes involved in the generation and accumulation of hydrocarbons and demonstration of how geological and geophysical techniques can be applied to explore for oil and gas.

324pp | Jul 2017 | 978-1-78634-206-5 | US\$88 / £77

Volume  
2



This book covers the fundamentals of reservoir engineering in the recovery of hydrocarbons from underground reservoirs. It provides a comprehensive introduction to the topic, including discussion of recovery processes, material balance, fluid properties and fluid flow. It also contains details of multiphase flow, including pore-scale displacement processes and their impact on relative permeability, with a presentation of analytical solutions to multiphase flow equations. Created specifically to aid students through undergraduate and graduate courses, this book also includes exercises with worked solutions, and examples of previous exam papers for further guidance and practice.

404pp | May 2017 | 978-1-78634-209-6 | US\$88 / £73

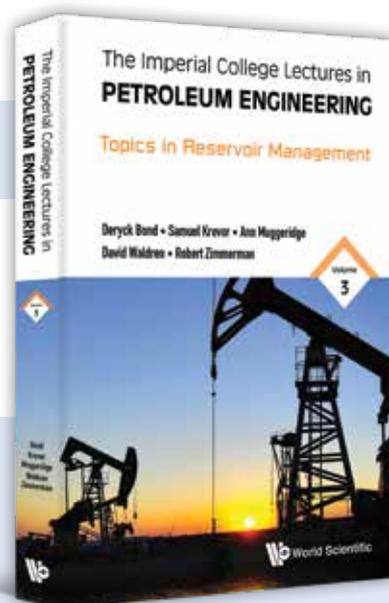
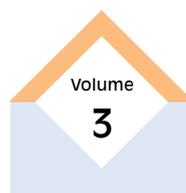
# The Imperial College Lectures in **PETROLEUM ENGINEERING** Topics in Reservoir Management

by **Anne Muggeridge, Sam Krevor, Robert Zimmerman**  
(Imperial College London, UK),

**Deryck Bond** (Kuwait Oil Company, Kuwait) &  
**David Waldren** (Petroleum Consulting and Training (PCT) Ltd, UK)

**T**his book covers several aspects of reservoir management, from initial analysis to enhanced recovery methods, simulation, and history matching. Split into four parts, part one provides readers with an introduction to the physical properties of reservoir rocks. Part two provides an introduction to enhanced recovery methods used for conventional oil production. Part three shows how numerical methods can be used to simulate the behaviour of oil and gas reservoirs. Finally, part four looks at history matching of reservoirs through the building of numerical models using past data, in order to provide best practice for future reservoir development and management.

268pp | Oct 2017 | 978-1-78634-284-3 | US\$78 / £65

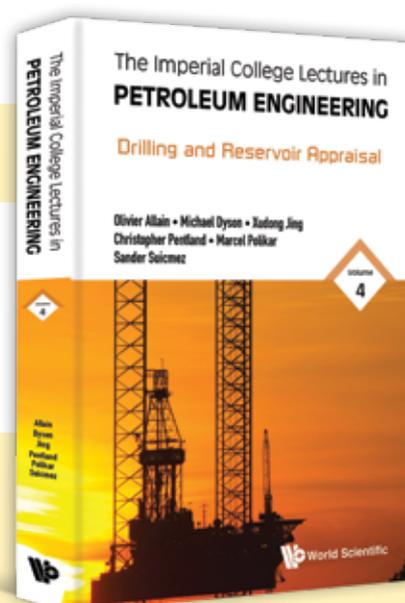


# The Imperial College Lectures in **PETROLEUM ENGINEERING** Drilling and Reservoir Appraisal

by **Olivier Allain** (KAPPA, France), **Michael Dyson** (Striatum Ltd, UK),  
**Xudong Jing** (Shell, Netherlands), **Christopher Pentland**  
(Petroleum Development Oman, Oman), **Marcel Polikar**  
(Independent Consultant, Canada) & **Sander Suicmez**  
(Maersk Oil & Gas, Denmark)

**T**his book covers the fundamentals of drilling and reservoir appraisal for petroleum. Split into three sections, the first looks at the basic principles of well engineering in terms of planning, design and construction. It then goes on to describe well safety, costs and operations management. The second section is focussed on drilling and core analysis, and the laboratory measurement of the physico-chemical properties of samples. Finally, in the third section we look at production logging, an essential part of reservoir appraisal, which describes the nature and the behaviour of fluids in or around the borehole. It describes how to know, at a given time, phase by phase, and zone by zone, how much fluid is coming out of or going into the formation.

396pp | Oct 2018 | 978-1-78634-395-6 | US\$118 / £105

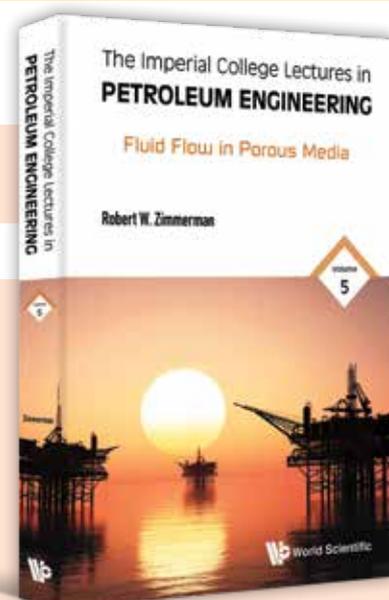


# The Imperial College Lectures in **PETROLEUM ENGINEERING** Fluid Flow in Porous Media

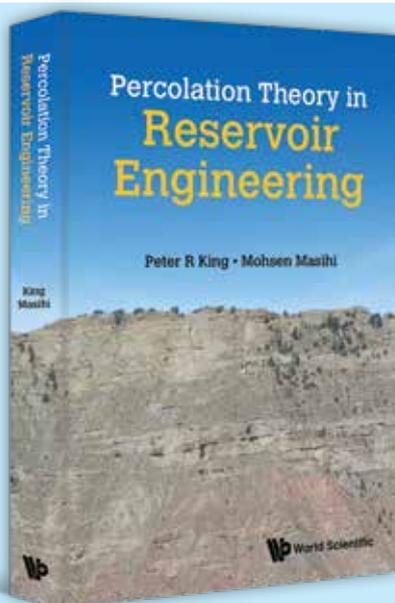
by **Robert W. Zimmerman** (Imperial College London, UK)

**T**his book presents, in a self-contained form, the equations of fluid flow in porous media, with a focus on topics and issues that are relevant to petroleum reservoir engineering. No prior knowledge of the field is assumed on the part of the reader, and particular care is given to careful mathematical and conceptual development of the governing equations, and solutions for important reservoir flow problems. Fluid Flow in Porous Media starts with a discussion of permeability and Darcy's law, then moves on to a careful derivation of the pressure diffusion equation. Solutions are developed and discussed for flow to a vertical well in an infinite reservoir, in reservoirs containing faults, in bounded reservoirs, and to hydraulically fractured wells. Special topics such as the dual-porosity model for fractured reservoirs, and fluid flow in gas reservoirs, are also covered. The book includes twenty problems, along with detailed solutions.

220pp | May 2018 | 978-1-78634-499-1 | US\$78 / £69



# PETROLEUM AND GEOSCIENCE

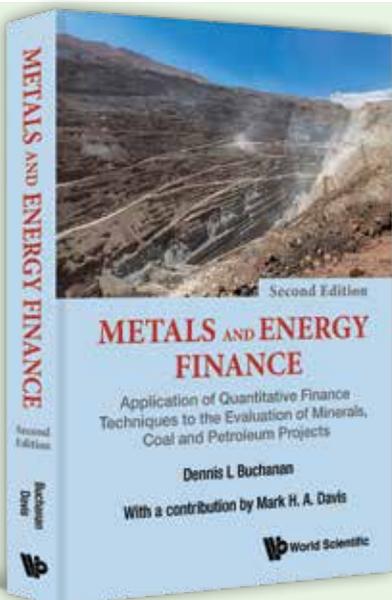


## Percolation Theory in Reservoir Engineering

By **Peter R King** (*Imperial College London, UK*) & **Mohsen Masihi** (*Sharif University of Technology, Iran*)

**T**his book aims to develop the ideas from fundamentals of percolation theory to practical reservoir engineering applications. Through a focus on field scale applications of percolation concepts to reservoir engineering problems, it offers an approximation method to determine many important reservoir parameters, such as effective permeability and reservoir connectivity and the physical analysis of some reservoir engineering properties. Starring with the concept of percolation theory, it then develops into methods to simple geological systems like sand-bodies and fractures. The accuracy and efficiency of the percolation concept for these is explained and further extended to more complex realistic models.

**384pp | Nov 2018 | 978-1-78634-523-3 | US\$118 / £104**



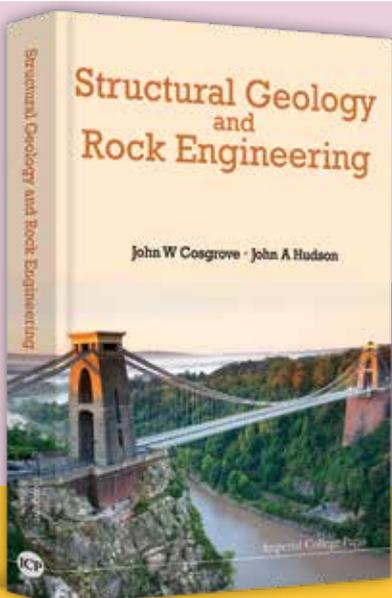
## Metals and Energy Finance

### Application of Quantitative Finance Techniques to the Evaluation of Minerals, Coal and Petroleum Projects 2nd Edition

By **Dennis L Buchanan** & **Mark H A Davis** (*Imperial College London, UK*)

**G**iven the design component it involves, financial engineering should be considered equal to conventional engineering. By adopting this complementary approach, financial models can be used to identify how and why timing is critical in optimizing return on investment and to demonstrate how financial engineering can enhance returns to investors. *Metals and Energy Finance* capitalizes on this approach, and identifies and examines the investment opportunities offered across the extractive industry's cycle, from exploration through evaluation, pre-production development, development and production. The textbook also addresses the similarities of a range of natural resource projects, whether minerals or petroleum, while at the same time identifying their key differences.

**328pp | Jan 2019 | 978-1-78634-587-5 | US\$108 / £95 | 978-1-78634-627-8 (pbk) | US\$58 / £50**



## Structural Geology and Rock Engineering

By **John W Cosgrove** & **John A Hudson** (*Imperial College London, UK*)

**T**he exploration and extraction of the earth's resources are key issues in global industrial development. In the 21st century, emphasis has increasingly being placed on geo-engineering safety, engineering accountability and sustainability. With focus on rock engineering projects, *Structural Geology and Rock Engineering* uses case studies and an integrated engineering approach to provide an understanding of projects constructed on or in rock masses. Based on Professors Cosgrove and Hudson's university teaching at Imperial College London, as well as relevant short course presentations, it explains the processes required for engineering modelling, design and construction.

**552pp | Oct 2016 | 978-1-78326-956-3 | US\$125 / £104 | 978-1-78326-957-0 (pbk) | US\$70 / £58**

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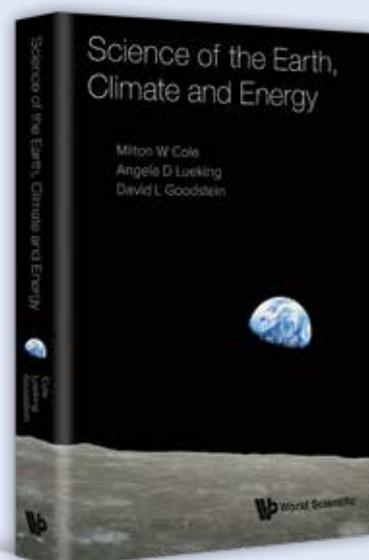
## Science of the Earth, Climate and Energy

By **Milton W Cole, Angela D Lueking** (both of *Pennsylvania State University, USA*) & **David L Goodstein** (*Caltech*)

Whether on personal health, politics, or climate change, we are constantly bombarded with more numerous 'breaking news' articles than we have time for. In such an environment, how can we tell which to read, or which is even true. *Science of the Earth, Climate and Energy* helps readers understand major issues that affect us individually and the world as a whole.

In language that a non-scientist can follow easily, the book first explains the general principles of science, its nature and how it works, with a certain degree of emphasis on the meaning of the words "uncertainty" and "fact, before it goes into the related topics of the earth, its climate and energy sources at a level that does not require a background in science. Finally, the book addresses what individuals and societies can do to mitigate problems associated with both climate change and limited resources.

580pp | Jun 2018 | 978-981-3233-61-4 | US\$150 / £130



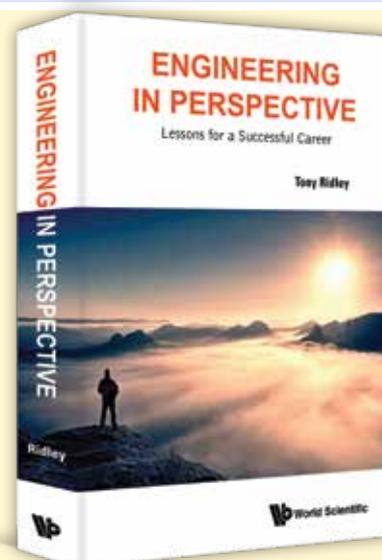
## Engineering in Perspective

### Lessons for a Successful Career

By **Tony Ridley** (*Imperial College London, UK*)

*Engineering in Perspective* provides a unique look into the career of one of Britain's most widely experienced engineers, Professor Tony Ridley. Ridley analyses key moments from his career to identify the real-world skills required for success. Through this, he examines how important it is that a successful engineer has not only traditional engineering skills but also good interpersonal skills coupled with a deep understanding of social, economic and political factors.

340pp | Apr 2017 | 978-1-78634-227-0 | US\$98 / £81 | 978-1-78634-228-7 (pbk) | US\$48 / £40

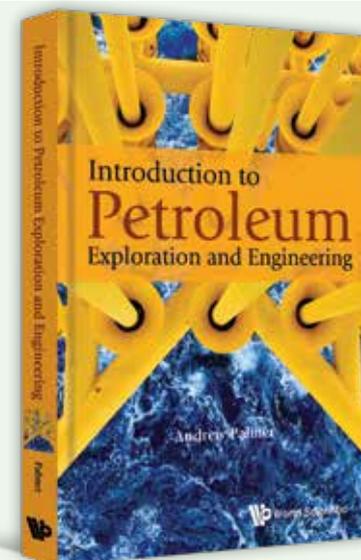


## Introduction to Petroleum Exploration and Engineering

By **Andrew Palmer** (*NUS, Singapore*)

This book is an introduction to oil and gas designed to be both accessible to absolute beginners who know nothing about the subject, and at the same time interesting to people who work in one area (such as drilling or seismic exploration) and would like to know about other areas (such as production offshore, or how oil and gas were formed, or what can go wrong).

156pp | Nov 2016 | 978-981-3147-77-5 | US\$72 / £60 | 978-981-3147-78-2 (pbk) | US\$38 / £32



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