

Brief Newsletter from World Scientific

December 2016

World Scientific Congratulates its Author Stephen Hawking on Pride of Britain Award 2016

World Scientific congratulates its author and one of the world's most influential scientists Stephen Hawking on being conferred the prestigious Pride of Britain Award.

Professor Hawking has authored two bestselling books with World Scientific which give insight into the breadth of his scientific achievements; *Hawking on the Big Bang and Black Holes* and *Euclidean Quantum Gravity*.

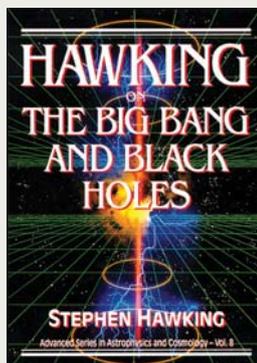
For more information on Professor Hawking's books with World Scientific, please click on the following links:



Advanced Series in Astrophysics and Cosmology: Volume 8

Hawking on the Big Bang and Black Holes

By: **Stephen Hawking**



A compilation of Stephen Hawking's most important work, the volume is an essential item in any library and will be an important reference source for all interested in theoretical physics and applied mathematics.

"... Collected together, these brilliant works constitute a valuable contribution to the literature on modern classical and quantum gravity and cosmology. This book will certainly be a source of inspiration for new generations of physicists entering into this fascinating area of research."

D Gal'tsov

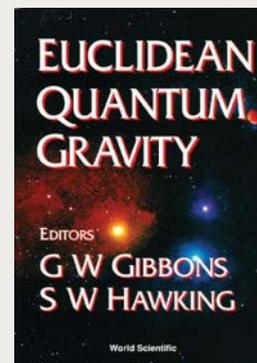
Classical & Quantum Gravity

<http://www.worldscientific.com/worldscibooks/10.1142/1751>



Euclidean Quantum Gravity

Edited by: **G W Gibbons** (Cambridge), **S W Hawking** (Cambridge)



An important collection of survey lectures and reprints of important lectures on the Euclidean approach to quantum gravity in which the Feynman path integral is expressed as a sum over Riemannian metrics. In addition to papers on basic formalism, the volume also includes there are sections on Black Holes, Quantum Cosmology, Wormholes and Gravitational Instantons.

"This book can certainly be recommended to anyone who works in general relativity, and especially in quantum gravity."

General Relativity and Gravitation

<http://www.worldscientific.com/worldscibooks/10.1142/1301>



The David J. Thouless I Know



Recently, the 2016 Nobel Prize in Physics was announced. Three British physicists were joint recipients of the prize: David J. Thouless, Duncan M. Haldane and J. Michael Kosterlitz. They were awarded "for theoretical discoveries of topological phase transitions and topological phases of matter". Among the trio, David J. Thouless was awarded one half of the prize.

What was regrettable was the prize came a little too late for David J. Thouless, who has a mild form of Alzheimer's disease. When Charles Kuen Kao, the "Father of Fiber Optics", received the Nobel Prize seven years ago, he also had Alzheimer's disease. This was a matter of some regret.

David J. Thouless received his doctorate degree from Cornell University, under the supervision of Hans Bethe. He was also greatly influenced by Rudolf Peierls, who served as the Head of the Mathematical Physics Department at the University of Birmingham for many years. David Thouless served as a professor of mathematical physics at the University of Birmingham from 1965 to 1978. His most important work, including the research that garnered him the Nobel Prize, was done during the period when he was in Birmingham. David Thouless was both my teacher as well as a good friend. We had close interaction and he is a modest and diligent gentleman. From our interaction during that period as well as subsequent communication, I have noted several characteristics which are worthy of attention and which are similar to those of CN Yang's.

Firstly, like fellow physicist CN Yang, he placed great value on mathematics and had a solid foundation in mathematics. CN Yang came from a family of scholars and his father, Yang Wu-Chih, was a famous mathematician. In addition, CN Yang maintained a close friendship with mathematics master Shiing-Shen Chern. These were all "supports" for his subsequent development.

David Thouless has great talent in mathematics, which proved very useful for the subsequent research he did in mathematical physics. Topology is the study of geometrical properties and spatial relations unaffected by the continuous change of shape or size of figures. It was originally an important branch of modern mathematics, but gradually penetrated the field of quantum physics and became an important mathematical method for the study and analysis of states of continuity and connectivity of materials. I believe if David Thouless had lacked a solid foundation in mathematics, he would not have achieved such success.

Secondly, he did not follow trends nor the crowd when it came to research. His capacity for independent thinking was something I found to be very important.

Thirdly, he placed great emphasis on experimental results, another characteristic he shared with CN Yang. All theory is inseparable from experiments. CN Yang was once a follower of American

physicist Enrico Fermi. He had intended to engage in experimental physics with Fermi, but at that time, Fermi's laboratory was in Argonne and was a top secret lab to which CN Yang was not granted entry. Hence, Fermi recommended that CN Yang carry out theoretical work with Edward Teller. Although CN Yang had little to do with experimental physics later in his career, he still placed great importance on experiments. David Thouless was much the same.

Fourthly, David Thouless was extremely inquisitive and full of interest in new matters and knowledge. He was always eager to sit in on conferences which had nothing to do with his specialisation because he wanted to understand the latest developments in other fields of science. Naturally, he was not God but a human who could not possibly understand everything. There were times when he honestly told me that he "did not understand". These three words were of great inspiration to me in my own intellectual journey, as many things progressed from "unknown" to "known".

Fifthly, when I was at the University of Birmingham, I discovered that David Thouless was an extraordinarily diligent person who was often the last to leave the office. He was a typical gentleman, modest, slow of speech but quick in action. While he was not a fantastic lecturer, he was willing to chat privately. As a result, "afternoon tea" became the best time for our exchanges and I learnt a lot from him during those tea sessions.

CN Yang was one of David Thouless' idols. Between 31 October and 3 November 2007, David Thouless attended an academic conference in celebration of CN Yang's 85th birthday, which was held in Singapore. At the conference, David Thouless delivered a speech titled "Topological Quantum Numbers and Phase Transitions", which was well received. In addition, David Thouless has also personally written, edited and contributed to two high level academic volumes: *Topological Quantum Numbers in Nonrelativistic Physics* and *40 Years of Berezinskii-Kosterlitz-Thouless Theory*; both published by World Scientific Publishing Company, Singapore, a company I founded.

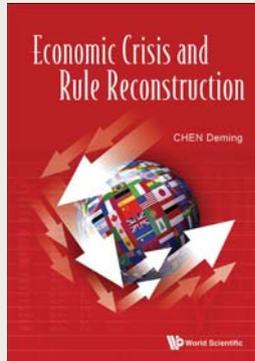
He spent much effort on both books which have become important classics in scientific literature. Now that he has been awarded the Nobel Prize, the prestige and authority of both volumes have consequently increased.

Most youth currently receive a very examination-oriented education. Our youth should carefully consider and strive to learn from the unique manner and spirit with which David Thouless dealt with knowledge and scientific research.



The author, Dr Phua Kok Khoo, is the Director of the Institute of Advanced Studies, Nanyang Technological University and chairman and editor-in-chief of World Scientific Publishing.

Economic Crisis and Rule Reconstruction **Launched by Former Chinese Minister of Commerce**



From left to right: Former Singapore Deputy Prime Minister Mr Wong Kan Seng and former Australian Prime Minister John Howard with author, former Chinese Minister of Commerce, Dr Chen Deming, at the book launch.

World Scientific launched the English edition of a major volume on the state of trade rules after the devastating impact of the global financial crisis in an event graced by former Singapore Deputy Prime Minister Mr Wong Kan Seng.

Built on a historical narrative of the 2008 global economic crisis, former Chinese Minister of Commerce, Dr Chen Deming's latest book, *Economic Crisis and Rule Reconstruction*, has garnered much interest.

Commending Dr Chen on his book, Robert Azevedo, Director-General of the World Trade Organisation (WTO) said, "With this book, Minister Chen has made an early, important and insightful contribution to the debate. Certainly, any conversation on rules restructuring within the WTO will benefit from his thoughts and analysis."

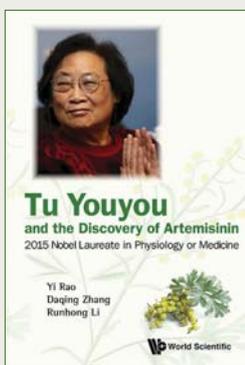
Pascal Lamy, former Director-General of the WTO, also lent his opinion. "Where I believe Chen deploys his formidable pedagogic qualities is in his description of the new patterns of international trade: global value chains, the real world we live in as opposed to the conventional world of trade most trade experts still have in mind ... In the future, obstacles to trade will lie more and more in measures the purpose of which is to protect the consumers ... In short, opening trade is evolving from tariff reduction to regulatory harmonisation."

For full coverage of the event, please visit <http://www.worldscientific.com/doi/story/10.1142/news.2016.09.19.229>

Economic Crisis and Rule Reconstruction is available for purchase on WSPC online and in all bookshops
<http://www.worldscientific.com/worldscibooks/10.1142/9916>



World Scientific Showcases Book on First Chinese Female Nobel Laureate



World Scientific's landmark publication on the first Chinese female Nobel laureate was showcased at an international conference attended by the who's who of Chinese and mainstream Western medicine. Titled *Tu Youyou and the Discovery of Artemisinin: 2015 Nobel Laureate in Physiology or Medicine*, this book compiles of first-hand accounts that present unique insight into Professor Tu's groundbreaking research, including the work for which she was awarded the 2015 Nobel Laureate in Physiology or Medicine.

The International Conference on the Modernization of Chinese Medicine attracted many professionals and distinguished guests, including TCM researchers and biomedical scientists as well as Singapore's Minister for Health, Mr Gan Kim Yong, and the Director General of the World Health Organization, Dr Margaret Chan.

"Chinese medicine has been in the limelight in recent months after Prof Tu Youyou of the China Academy of Chinese Medicine was awarded the Nobel prize in medicine for the discovery of Artemisinin. We are proud to note that a Singapore-based publisher will be displaying a new book on her work in the book exhibition in the foyer."

Professor Hong Hai

Singapore Executive Council Member, Academy of Chinese Medicine

<http://www.worldscientific.com/worldscibooks/10.1142/10040>



New and Upcoming Titles

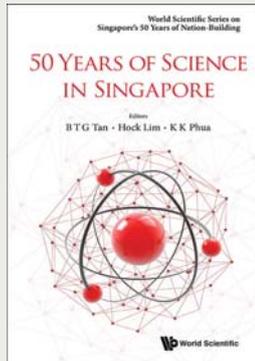
World Scientific Series on Singapore's 50 Years of Nation-Building

50 Years of Science in Singapore

Edited by: **B T G Tan** (*National University of Singapore*),

Hock Lim (*National University of Singapore*),

K K Phua (*Institute of Advanced Studies, Nanyang Technological University, Singapore*)



As part of the commemorative book series on Singapore's 50 years of nation-building, this important compendium traces the history and development of various sectors of Singapore science in the last 50 years. The book covers government agencies responsible for science funding and research policy, academic institutions and departments who have been at the forefront of the development of the nation's scientific manpower and research bases, the research centres and institutes which have been breaking new ground in both basic and applied science research, science museums and education, as well as academic and professional institutions which the scientific community has set up to enable Singapore scientists to serve the nation more effectively.

Each article is a chronicle written by eminent authors who have played important roles and made significant contributions in shaping today's achievements in science in Singapore.

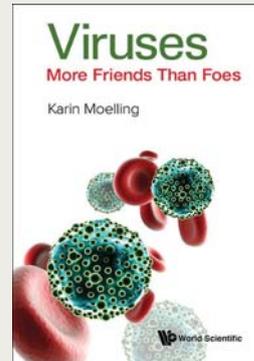
Professionals, academics, students and the general public will find this volume to be useful reference material and an inspirational read.

<http://www.worldscientific.com/worldscibooks/10.1142/10057>



Viruses: More Friends Than Foes

By **Karin Moelling** (*University of Zurich, Switzerland & Max Planck Institute for Molecular Genetics, Berlin, Germany*)



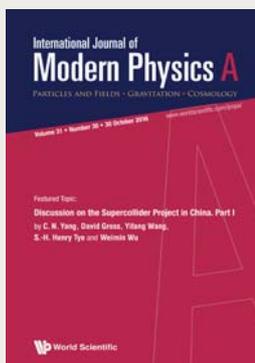
From renowned virologist and cancer researcher Karin Moelling comes a book that seeks to change current views on viruses. Readers are told that viruses are ubiquitous and could be capable of a variety of functions ranging from influencing the weather to applications against the threats of bacteria which are multi-resistant.

Drawing on recent research and, in part, her own research results, the author sparks interest in debates and questions. Could viruses have been our oldest ancestors? Have viruses even "invented" social behaviour, do they lead to geniuses such as Mozart or Einstein — or alternatively to cancer?

Making a clear distinction between fact and personal vision, the book targets both experts in the field and a general audience. Stimulating in both content and style, the volume could well encourage young scientists to take an interest in this area of research.

<http://www.worldscientific.com/worldscibooks/10.1142/10230>





World Scientific's IJMPA Features Debate On China's Supercollider Project

Volume 31, Number 30 of World Scientific's International Journal of Modern Physics A proudly presents the first official debate forum on China's Supercollider Project. Featuring the candid opinions of Nobel laureates such as CN Yang and David Gross as well as experts such as S-H Henry Tye, the forum brings both sides of the current controversy across to readers in this special edition.

For further insight into the opinions and controversy surrounding the project, please visit <http://www.worldscientific.com/toc/ijmpa/31/30>



China should not build a supercollider at this time

C. N. Yang

Nobel Laureate in Physics 1957
Vol. 31, No. 30 (2016) 1630053



Supplement to the "Giant Collider in China" debate: Background on Prof. C. N. Yang's opinion on high-energy physics

S.-H. Henry Tye

Director of Institute for Advanced Study, Hong Kong University of Science and Technology
Vol. 31, No. 30 (2016) 1630056



Why China should build the Great Collider:

A response to C. N. Yang

David Gross

Nobel Laureate in Physics 2004
Vol. 31, No. 30 (2016) 1630054



I support China to build the CEPC on the premise that the US would actively participate in CEPC

Weimin Wu

Formerly deputy director of BES, Chinese group leader of ALEPH, Fermilab retired physicist
Vol. 31, No. 30 (2016) 1630057



It is suitable now for China to construct large colliders

Yifang Wang

Director of Institute of High Energy Physics, Chinese Academy of Sciences
Vol. 31, No. 30 (2016) 1630055

Season's Greetings

Holiday SALE
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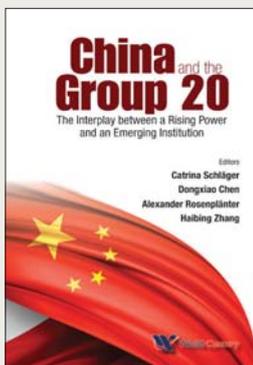
World Scientific
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Social Sciences New Titles

China and the Group 20

The Interplay between a Rising Power and an Emerging Institution

Edited by: **Catrina Schläger** (*Friedrich-Ebert-Stiftung, Germany*),
Dongxiao Chen (*Shanghai Institutes for International Studies, China*),
Alexander Rosenplänter (*Friedrich-Ebert-Stiftung, Germany*),
Haibing Zhang (*Shanghai Institutes for International Studies, China*)



Since the great financial crisis in 2008, the Group 20 (G20) has played an increasingly important role in global economic governance as an emerging global macroeconomic coordination mechanism. *China and the Group 20* provides experts' observations on the development of the G20, G20's influence on global economic governance and China's role in this emerging institution.

Analyses in the volume's two halves concentrate on different areas of concern for the book's editors. The first part of the book analyses important policy issues facing the G20 and global economic governance, including the G20's role in strengthening and promoting global macroeconomic coordination; reform of the international financial system; the integration of international trade and investment regimes among other topics of international trade. The second part focuses on China's relations with the United States, the EU, and the other BRICS countries, and their implications for G20's development. China, as the largest developing country and the second largest economy, has the responsibility to safeguard the general interests of developing countries on the one hand, and to cooperate with developed countries to create an equal and open economic environment on the other. As the chapters are contributed by experts from the main member countries of the G20, the book is an invaluable read for all interested in the impact of a rising China upon international politics and trade.

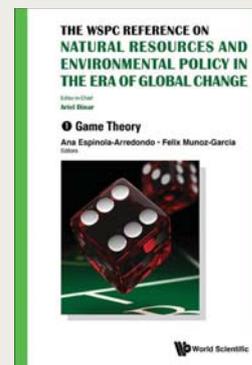
<http://www.worldscientific.com/worldscibooks/10.1142/u029>



The WSPC Reference on Natural Resources and Environmental Policy in the Era of Global Change

(4 Volumes)

Editor-in-chief: **Ariel Dinar** (*UC Riverside*)
Edited by: **Ana Espinola-Arredondo** (*Washington State University, USA*),
Felix Munoz-Garcia (*Washington State University, USA*),
Richard A Matthew (*UC Irvine*), **Connor Harron** (*UC Irvine*),
Kristen Goodrich (*UC Irvine*), **Bemmy Maharramli** (*UC Irvine*),
Evgenia Nizkorodov (*UC Irvine*), **Tony Bryant** (*Macquarie University, Australia*),
Anabela Botelho (*University of Aveiro, Portugal*)



A comprehensive and prominent collection of various highly authoritative volumes of milestone concepts and theories, *The WSPC Reference on Natural Resources and Environmental Policy in the Era of Global Change* features leading experts in the fields of Game Theory, International Relations and Global Politics, Computable General Equilibrium (CGE): Economy-Wide Modeling, and Experimental Economics.

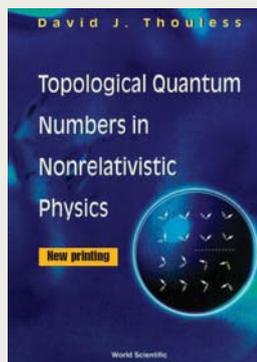
Each book in the reference set includes chapters curated by respected researchers in fields on issues related to natural resources and environmental policy in the era of global change. With an overall focus on the economic and strategic aspects of interactions between various parts of society, all dependent on the availability and utilization of limited natural resources and their impact on the environment, the collection addresses current challenges and future perspectives along with policy implications.

The collection provides a unique perspective on issues that engage the public discourse of researchers and policy-makers at state, regional, and global levels. Collectively, the volumes present a comprehensive overview of questions relating to natural resources and environmental policy in the era of global change.

<http://www.worldscientific.com/worldscibooks/10.1142/9747>



Reviews



Michael E. Fisher Reviews

Topological Quantum Numbers in Nonrelativistic Physics

This excellent book, just now reprinted, is written with the typical clarity for which the author, David Thouless, is well known. It is surely to be welcomed, especially in light of the Nobel Prize awarded this year, 2016, to Thouless together with Michael Kosterlitz and Duncan Haldane.

Starting with a systematic overview of the complexity of the topological aspects in so many different contexts, Thouless provides more detailed accounts in eight subsequent chapters. This well-presented material is, in turn, supplemented, one must say exceptionally, by over 250 references!

In addition, the book contains some 41 reprints of the most crucial original articles. Included, is a notable 20-page review by David Mermin concerning surface singularities in Helium-3 with an explanation of the 'boojum.' Likewise, for Helium-3 and liquid crystals the important paper by G.E. Volovik and V.P. Mineev (1977) is reprinted while Volovik's 1992 book on Helium-3 is clearly featured.

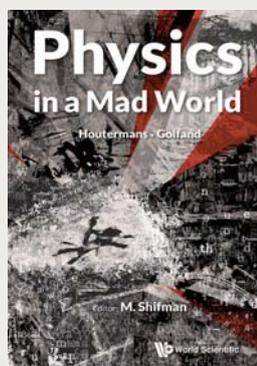
Each section of the reviews is introduced by Thouless with a brief but clear explanation of precisely why they have been chosen. Other notable reviews are by W.F. Vinen in 1961, by Kosterlitz and Thouless and by Kosterlitz alone (1973-4). As evidence of the wide sweep, an early article by Paul Dirac on magnetic monopoles in 1931 is presented with a basic paper by Aharonov and Bohm in 1959 concerning the vector potential in quantum mechanics. Important later articles are by Robert Laughlin on the quantum Hall effect and, for topological fluids, the exceptional review by X.G. Wen and A. Zee (1992).

For solids and liquid crystals, especially significant papers are by M. Kléman and G. Toulouse. Finally, the famous Kosterlitz and Thouless article heads up the last section of nine papers on topological phase transitions; this includes the striking universal jump at criticality in two-dimensional superfluids predicted by David Nelson with Michael Kosterlitz (1977) and soon afterward verified by John Reppy and David Bishop.

In conclusion, this is a very special book by a very special author.

Written by: **Michael E. Fisher** (*University of Maryland, College Park, USA*)

Readers keen on acquiring a copy of *Topological Quantum Numbers in Nonrelativistic Physics* by David J Thouless may via the following link: <http://www.worldscientific.com/worldscibooks/10.1142/3318>



Extract of Review for *Physics in a Mad World*

Much has been written about the fate of Jewish scientists in Soviet Russia, but I have never seen anything quite like *Physics in a Mad World*. It consists of two long essays on the physicists Friedrich Houtermans and Yuri Golfand. Both of these are written by Russians who had access to police files. The book's editor, Mikhail Shifman, now a professor at the University of Minnesota and a distinguished theoretical physicist, was also born in Soviet Latvia. He supplies useful comments. The essay on Houtermans by Viktor Frenkel, which takes up much the largest portion of the book, is particularly remarkable, but Golfand also deserves close attention.

From Great Scientists Against Terrible Odds

By **Jeremy Bernstein**

The New York Review of Books

December 8 2016 Issue

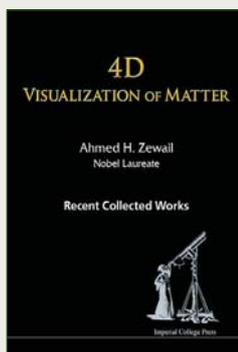
On *Physics in a Mad World*

edited by **M. Shifman** and translated from Russian by **James Manteith**

<http://www.worldscientific.com/worldscibooks/10.1142/9281>



Reviews



4D Visualization of Matter

Recent Collected Works of Ahmed H Zewail, Nobel Laureate

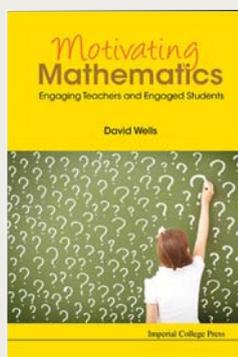
by Ahmed H Zewail

"The collection of remarkable papers brought together in this book by Ahmed Zewail tells a compelling and indeed thrilling story of extraordinary innovation and discovery over some 15 years ... they give us just a glimpse of a future in which our knowledge of the world in which we live will be transformed by the breakthroughs described in this fascinating volume."

-Christopher Martin Dobson

John Humphrey Plummer Professor of Chemical and Structural Biology
Department of Chemistry, University of Cambridge

<http://www.worldscientific.com/worldscibooks/10.1142/p953>



Motivating Mathematics

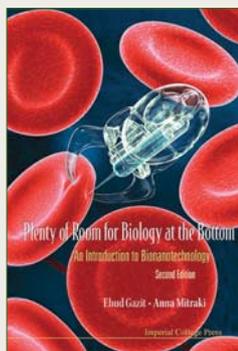
Engaging Teachers and Engaged Students

by David Wells

"Throughout the book, Wells draws on his personal experiences. He understands how students think and, more importantly, how they perceive mathematics. We owe it to our students to provide them with the necessary tools not only to solve problems, but also to be better thinkers. To allow self-discovery and struggle when first approached with new concepts, and thereby to create a fun and motivating mathematical environment, is vital to a student's success."

Mathematical Association of America

<http://www.worldscientific.com/worldscibooks/10.1142/p1023>



Plenty of Room for Biology at the Bottom

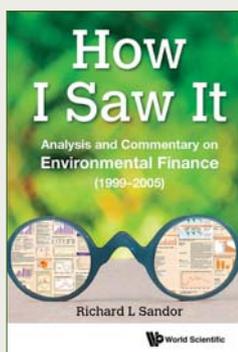
An Introduction to Bionanotechnology (2nd Edition)

by Ehud Gazit & Anna Mitraki

"The book deals with a complex topic, but presents the material in an engaging and compelling style that offers something to both the general reader and subject expert. Plenty of Room is superbly underpinned by subject specific, peer reviewed material and enhanced by some beautiful illustrations. It's a delightful and detailed overview of an emerging area of science."

-The Biologist

<http://www.worldscientific.com/worldscibooks/10.1142/p862>



How I Saw It

Analysis and Commentary on Environmental Finance (1999-2005)

by Richard L Sandor

"This book is a must-read for all who want to understand the history of environmental finance. Richard Sandor is a true champion for the planet whose provocative thought catalyzed the development of carbon markets across the world and has played an invaluable role in addressing the biggest challenges facing humanity today."

-Dr Andrew Steer
President and CEO
World Resources Institute

<http://www.worldscientific.com/worldscibooks/10.1142/10329>

