

**IISc
Press**

Textbooks | Monographs | Lecture Notes | General Books |
Biographies | Popular Science

About Us

IIScPress was established in 2008, with a mission to bring quality books at affordable prices for helping Indian post-graduate education in science and engineering.

It was launched in the centenary year of the Indian Institute of Science (IISc), Bangalore, a research and post-graduate educational institution, known for its science and technology research in India and worldwide.

Besides self-publishing, IIScPress publishes a variety of books with its co-publishing partners, and brings out research monographs, collected works of distinguished scientists, lecture notes, textbooks, biographies, popular science books, general books and also other books.

The IIScPress has been publishing books in collaboration with World Scientific Publishing Company (WSPC) since 2008. In 2013, IIScPress signed a co-publishing agreement with Cambridge University Press (CUP), the world's oldest publisher and the second largest university press.

Series published with co-publishers are listed below:

- ▶ **ICLS: IISc Centenary Lectures Series | Co-publisher: World Scientific Publishing Company (WSPC)**
- ▶ **IRMS: IISc Research Monographs Series | Co-publisher: World Scientific Publishing Company (WSPC)**
- ▶ **ILNS: IISc Lecture Notes Series | Co-publisher: World Scientific Publishing Company (WSPC)**
- ▶ **IPSS: IISc Popular Science Series | Co-publisher: Cambridge University Press (CUP)**
- ▶ **Other books: Biographies and general books**

IIScPress invites authors from India and abroad to explore publishing with us.

IISc Centenary Lecture Series (ICLS)

Series Editor: Prof. Amaresh Chakrabarti

Features:

- Books written by distinguished scientists
- Based on IISc Centenary Lectures delivered

Outcome:

- First book launched in 2009
- Five published titles

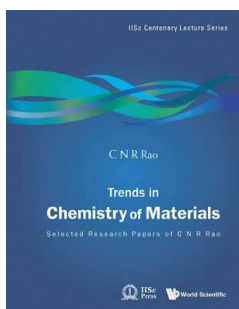
Titles published:

- Trends in Chemistry of Materials
- The Foundations of The Digital Wireless World
- Science and Sustainable Food Security
- Watching Ultrafast Molecular Motions With 2D IR Chemical Exchange Spectroscopy
- Tailoring Surfaces

Published authors

- CNR Rao
- Andrew J Viterbi
- MS Swaminathan
- Michael D Fayer

- Nicholas D Spencer



Trends in Chemistry of Materials

Selected Research Papers of CNR Rao

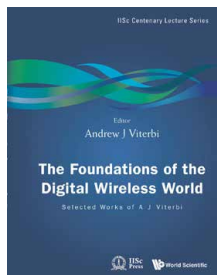
- CNR RAO, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru

ISBN 978-981-283-383-9 | Hardcover | Price: \$152

First published in 2008 | v+ 610 pages

Co-publisher: World Scientific Publishing Company

This book presents a selection of research articles of Prof. CNR Rao covering a wide range of aspects of the chemistry of materials. This book should provide the present day flavour of the subject, and also indicate trends and directions in this important area of materials.



The Foundations of the Digital Wireless World

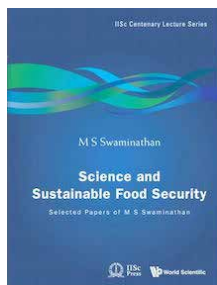
- **ANDREW J. VITERBI**, University of Southern California

ISBN 978-981-4287-50-0 | Hardcover | Price: \$85

First published in 2010 | v+174 pages

Co-publisher: World Scientific Publishing Company

This volume has been compiled from the manuscripts of the Centenary Lecture by AJ Viterbi presented at the Indian Institute of Science as well as from his papers which represent the milestones from his half-century career in the information and communication sciences with principal application to wireless systems.



Science and Sustainable Food Security

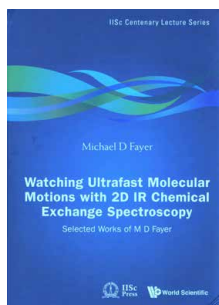
- **MS SWAMINATHAN**, MS Swaminathan Research Foundation, Chennai

ISBN 978-981-4282-10-9 | Hardcover | Price: \$111

First published in 2010 | v+ 420 pages

Co-publisher: World Scientific Publishing Company

This book provides a roadmap for achieving sustainable agricultural advance and food security in an era of climate change and global economic melt-down. The contents include a description of the paradigm shift under the leadership of the author, from a green to an evergreen revolution necessary for advancing productivity in perpetuity without ecological harm. The book will prove invaluable to all interested in sustainable human security and happiness.



Watching Ultrafast Molecular Motions with 2D IR Chemical Exchange Spectroscopy

Selected Works of MD Fayer

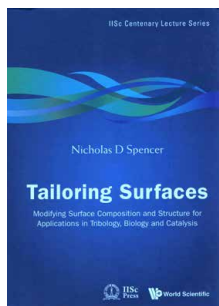
- MICHAEL D. FAYER, Stanford University

ISBN 978-981-4355-62-9 | Hardcover | Price: \$170

First published 2011 | v+ 373 pages

Co-publisher: World Scientific Publishing Company

This monograph is a written rendition of the Indian Institute of Science Centenary Lecture presented by Michael D. Fayer in 2008. In the lecture and in the monograph, he addresses the problem of how to experimentally examine fast molecular processes that occur under thermal equilibrium conditions without changing them.



Tailoring Surfaces: Modifying Surface Composition and Structure for Applications in Tribology, Biology and Catalysis

- NICHOLAS D. SPENCER, ETH Zurich

ISBN 978-981-4289-42-9 | Hardcover | Price: \$170

First published 2011 | v+ 373 pages

Co-publisher: World Scientific Publishing Company

The focus of this book is surface modification, with the goal of tailoring materials for a specific application. By means of this approach, ideal bulk properties of a material (such as its tensile strength, temperature, stability, density, or even cost) can be combined with optimized surface properties, such as hardness, biocompatibility, low or high friction adhesion, water repellency or wettability, or catalytic activity. The works of the author (many of his crucial papers are included) deal with the understanding and modification of surfaces and span fields including catalysis, analytical surface science, self-assembled monolayers, tribology, biomaterials, superhydrophobicity and polymer coatings.

IISc Research Monograph Series (IRMS)

Series Editor: Prof. Prabal Maiti

Features:

- Books written by distinguished scientists
- Covers contemporary topics in science and engineering

Outcome:

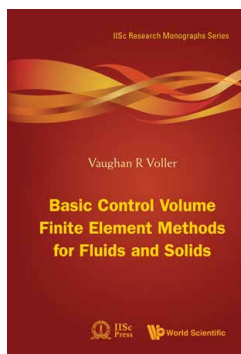
- First book launched in 2009
- Three published titles

Titles published:

- Basic Control Volume Finite Element Methods for Fluids & Solids
- Modern Applications of Automata Theory
- Aqueous Lubrication Natural and Biometric Approaches

Published authors

- Vaughan R. Voller
- Deepak D'souza and Priti Shankar
- Nicholas D Spencer



Basic Control Volume Finite Element Methods for Fluids and Solids

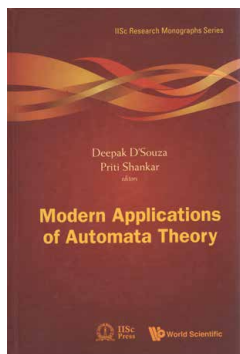
- VAUGHAN R. VOLLER, University of Minnesota

ISBN 978-981-283-498-0 | Hardcover | Price: \$54

First published in 2009 | v+170 pages

Co-publisher: World Scientific Publishing Company

The Control Volume Finite Element Method (CVFEM) is a hybrid numerical method, combining the physics intuition of Control Volume Methods with the geometric flexibility of Finite Element Methods. The concept of this monograph is to introduce a common framework for the CVFEM solution so that it can be applied to both fluid and solid mechanics problems. To emphasize the essential ingredients, the discussion focuses on the application to problems in two-dimensional domains which are discretized with linear-triangular meshes.



Modern Applications of Automata Theory

- DEEPAK D'SOUZA & PRITI SHANKAR, Indian Institute of Science, Bengaluru

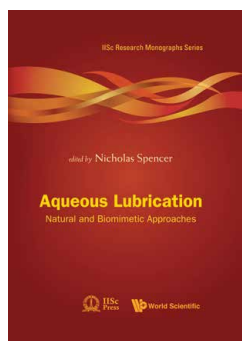
ISBN 978-981-4271-04-2 | Price: \$175

First published in 2012 | Hardcover | v+656 pages

Co-publisher: World Scientific Publishing Company

Automata theory came into prominence in recent years with a plethora of applications in fields ranging from verification to XML processing and files compression. In fact, the 2007 Turing Award was awarded to Clarke, Emerson and Sifakis for their pioneering work on model-checking techniques. To the best of our knowledge, there is no single book that covers the vast range of

applications of automata theory targeted at a mature student audience. This book is intended to fill that gap and can be used as an intermediate-level textbook. It begins with a detailed treatment of foundational material not normally covered in a beginner's course in automata theory and then rapidly moves on to applications. The book is largely devoted to verification and model checking and contains material that is cutting at the edge of verification technology. It will be an invaluable reference for software practitioners working in this area.



Aqueous Lubrication-Natural and Biometric Approaches

- NICHOLAS D. SPENCER, ETH Zurich

ISBN 978-981-4313-76-6 | Hardcover | Price: \$115

First published in 2014 | v+269 pages

Co-publisher: World Scientific Publishing Company

Man lubricates mostly with oil. Nature lubricates exclusively with water. Pure water is a pure lubricant, but the addition of proteins, especially glycoproteins, can modify surfaces to make them far more lubricated at slow speeds. Understanding how nature does this, and the physical structures involved, is not only important for the

understanding of diseases such as osteoarthritis, but also essential for the successful application of articulating implants, such as hips and knees, as well as the development of medical devices such as catheters and contact lenses. A host of important applications of water-based lubrication are already in place in the personal care and food industries, and further industrial applications of water-based lubrication could have a significant positive impact on the environment.

This book is the first of its kind. It brings together the latest research in biological and biomimetic, water-based lubrication and is authored by the world's experts in the field.

IISc Lecture Notes Series (ILNS)

Series Editor: Prof. Diptiman Sen

Features:

- Books written by distinguished scientists from IISc and others
- Covers contemporary topics in science and engineering
- Aims to provide lecture notes in form of quality books for post-graduate students of science and engineering
- Written in appealing format for self-learning as well as classroom teaching
- Covers basic subjects that need continual upgrading in today's fast-moving science and engineering frontiers
- Books under this series will cover emerging areas in science and engineering to make them accessible to students and teachers

Outcome:

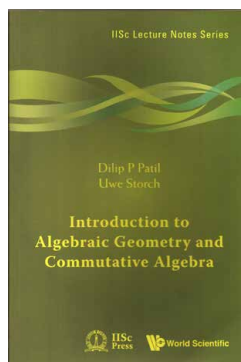
- First book launched in 2010
- Five published titles

Titles Published:

- Introduction to Algebraic Geometry and Commutative Algebra
- Shwarz's Lemma from a Differential Geometric Viewpoint
- Noise and Vibration Control
- Game Theory and Mechanism Design
- Introduction to Pattern Recognition and Machine Learning

Published Authors

- Dilip P. Patil & Uwe Storch
- Kang-tae Kim & Hanjin Lee
- ML Munjal
- Y Narahari
- M Narasimha Murty & V Susheela Devi



Introduction to Algebraic Geometry and Commutative

- DILIP P. PATIL, Indian Institute of Science, Bengaluru & UWE STORCH, Emeritus Professor

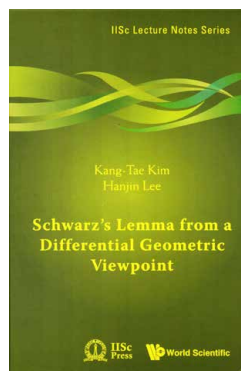
ISBN 978-981-4304-56-6 | Price: \$73

First published in 2010 | Paperback | v+207 pages

Co-publisher: World Scientific Publishing Company

This introductory textbook for a graduate course in pure mathematics provides a gateway into the two difficult fields of algebraic geometry and commutative algebra. Algebraic geometry, supported fundamentally by commutative algebra, is a

cornerstone of pure mathematics. Along the lines developed by Grothendieck, this book delves into the rich interplay between algebraic geometry and commutative algebra. With concise yet clear definitions and synopses a selection is made from the wealth of material in the disciplines including the Riemann-Roch theorem for arbitrary projective curves.



Schwarz's Lemma from a Differential Geometric Viewpoint

- KANG- TAE KIM, Pohang University of Science and Technology
- HANJIN LEE, Handong Global University, Korea

ISBN 978-981-4324-78-6 | Price: \$50

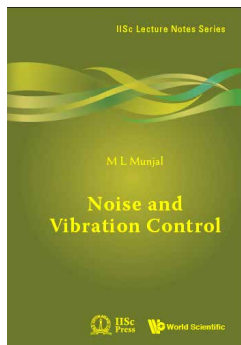
First published in 2011 | Hardback | vii+82 pages

Co-publisher: World Scientific Publishing Company

The subject matter in this volume is Schwarz's Lemma which has become a crucial theme in many branches of research in mathematics for more than a hundred years to date. This volume of lecture notes focuses on its differential geometric developments by several excellent authors including, but not limited to, L. Ahlfors, S.S.

Chern, Y. C. Lu, S. T. Yao and H. L. Royden.

This volume can be approached by a reader who has basic knowledge on complex analysis and Riemannian geometry. It contains major historical differential geometric generalizations on Schwarz's Lemma and provides the necessary information while making the whole volume as concise as ever.



Noise and Vibration Control

- ML MUNJAL, Indian Institute of Science, Bengaluru

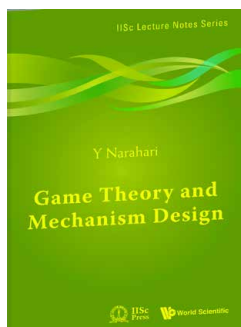
ISBN 978-981-4434-73-7 | Price: \$55

First published in 2013 | Hardcover | ix+277 pages

Co-publisher: World Scientific Publishing Company

Vibration and noise are two interrelated terms in the field of mechanical engineering. Vibration is caused by unbalanced inertial forces and moments whereas noise is the result of such vibrations. Noisy machines have always been a matter of concern. Lesser vibration ensures manufacturing to closer tolerances, lesser wear and tear, and longer fatigue life. Hence, a quieter

machine is more cost-effective in the long run. It is now well understood that a quieter machine is in every way a better machine. This book deals with such industrial and automotive noise and vibration, their measurement and control. This textbook stresses on physical concepts and the application thereof to practical problems. The author's four decades of experience in teaching, research and industrial consultancy is reflected in the choice of the solved examples and unsolved problems. The book targets senior undergraduate students in mechanical engineering as well as designers of industrial machinery and layouts. It can readily be used for self-study by practicing designers and engineers.



Game Theory and Mechanism Design

- Y NARAHARI, Indian Institute of Science, Bengaluru

ISBN 978-981-4525-04-6 | Price: \$148

First published in 2014 | Hardcover | vii+492 pages

Co-publisher: World Scientific Publishing Company

This book offers a self-sufficient treatment of a key tool, game theory and mechanism design, to model, analyze, and solve centralized as well as decentralized design problems involving multiple autonomous agents that interact strategically in a rational and intelligent way. The contents of the book provide a sound foundation of game theory and mechanism design theory which clearly represent the "science" behind traditional as well as emerging economic applications for the society.

Fast moving

"An excellent book, I benefitted greatly by reading the book".

- **R Chidambaram**, principal scientific adviser to the federal Government of India

"The books' masterful treatment of this subject makes it a 'must read' for every computer scientist or engineer aspiring to apply the theory of mechanism design to his problem."

- **Rajesh Sundaresan**, Department of Electrical Communication Engineering, IISc
Current Science, Vol. 111, No. 6, 25 September 2016

"I am pleased that Y Narahari has written this lovely text, which presents fundamentals of game theory and mechanism design clearly and concisely".

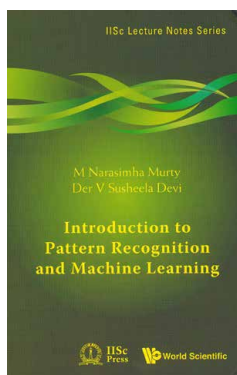
- **Eric Maskin**, Nobel Laureate (*Economic Sciences*, 2007)

"...one of the few books which present a detailed account of Non-Cooperative and Cooperative Games as well as Mechanism Design, all under one cover..."

- **Sanjoy K. Mitter**, Massachusetts Institute of Technology, Cambridge, MA, USA

"...a splendid book for engineers by an engineer..."

- **Vivek Borkar**, Indian Institute of Technology-Bombay, Mumbai



Introduction to Pattern Recognition and Machine Learning

- **M NARASIMHA MURTY**, Indian Institute of Science, Bengaluru
- **V SUSHEELA DEVI**, Indian Institute of Science, Bengaluru

ISBN 978-981-4335-45-4 | Price: \$125

First published in 2015 | Hardcover | xiii+383 pages

Co-publisher: World Scientific Publishing Company

This book adopts a detailed and methodological algorithmic approach to explain the concepts of pattern recognition. While the text provides a systematic account of its major topics such as pattern representation and nearest neighbour based classifiers, current topics – neural networks, support vector machines and decision trees –

attributed to the recent vast progress in this field are also dealt with. Introduction to Pattern Recognition and Machine Learning will equip readers, especially senior computer science undergraduates, with a deeper understanding of the subject matter.

"The book contains a good overview of many issues in machine learning and introduces the reader to most of the essential topics of machine learning in an easily understandable manner."

- **PS Sastry**, Department of Electrical Engineering, IISc, *Current Science*, Vol. 110, No. 7, 10 April 2016

IISc Popular Science Series (IPSS)

Series Editor: Prof. SP Arun

Features:

- Aims to produce popular science books for enhancing scientific literacy
- There are few outlets for Indian writers, journalists, scientists with an interest in explaining scientific ideas and technological achievements, and contributing to contemporary debates of great significance to the society at large (e.g. climate change, atomic energy, genetically modified crops), this series has been launched to fill this void.

Outcome:

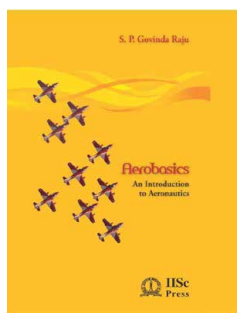
- First book launched in 2010
- Two published titles

Titles Published:

- Aerobasics: An Introduction to Aeronautics
- Popular Problems and Puzzles in Mathematics

Published Authors

- SP Govinda Raju
- Asok Kumar Mallik



Aerobasics

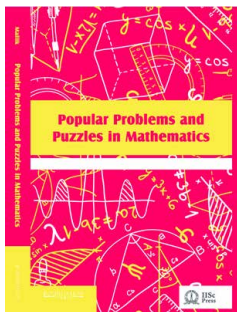
An Introduction to Aeronautics

- SP GOVINDA RAJU, Indian Institute of Science, Bengaluru

ISBN 978-81-925707-0-9 | Price: INR 300

First published in 2014 | Paperback | 245 pages

This book should be useful not only to fresh engineers entering the aeronautical industry but also to students in all the relevant branches of engineering. It is also likely to be of general interest to any scientifically inclined reader as a source of basic information in a number of aeronautical disciplines.



Popular Problems and Puzzles in Mathematics

- ASOK KUMAR MALLIK, Indian Institute of Engineering Science and Technology, Shibpur

ISBN 978-93-82993-86-5 | Price: INR 170

First published in 2014 | Paperback | 160 pages

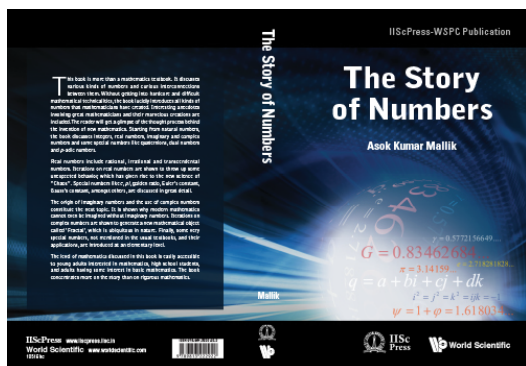
Co-publisher: Foundation Books, Cambridge University Press

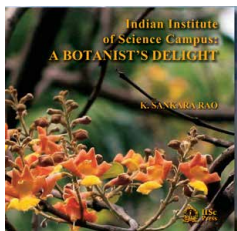
Innovative thinking backed by logical reasoning is the key to the puzzles in Popular Problems and Puzzles in Mathematics. Collected over several years by the author, more than 150 elegant, intriguing numerical challenges are presented here. The answers

are easy to explain, but one would devilishly find it hard without this book. One's ability to construct a mathematical proof will be rigorously tested in these problems - even in the case of a mathematics teacher. For true maths lovers, there is even a section on historically prominent problems. Designed for high-school students and teachers with an interest in mathematical problem solving, this stimulating collection provides a new twist to familiar topics that introduce unfamiliar topics.

Forthcoming title from the same author:

The Story of Numbers





Indian Institute of Science Campus: A Botanist's Delight

- K. SANKARA RAO, Indian Institute of Science, Bengaluru

Price: INR 1500

First published in 2008 | Hardcover | 224 pages

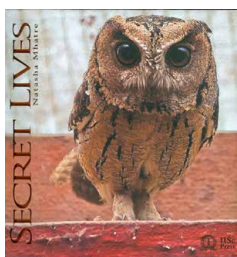
Indian Institute of Science Campus: A Botanist's Delight is a modest attempt to portray the rich, colourful and fascinating plant life on IISc campus, which is both native and exotic. The book is meant to carry the message that by increasing awareness, it will help in the protection of plants –for the plants needs protection.

The species described in this book have been mostly represented by their flowers, but leaves and other identifying features are also shown in many instances. The text that accompanies each photograph gives the common name, Latin (botanical/technical) name and the natural group (family) to which the plants belong. The book, in all, reflects the enchanting beauty of plants for the pleasure of all plant lovers "Sankara Rao's book describes the 200-odd plants and trees on the 320-acre campus"

- **Divya Gandhi**, *The Hindu*

"An admirable effort has been made by the author in producing an aesthetically appealing and scientifically accurate work; an elegant book".

- **HY Mohan Ram**, *Current Science*, Vol. 97, No. 2, 25 July 2009



Secret Lives

- NATASHA MHATRE, University of Toronto, Canada

Price: INR 1500

First published in 2009 | Hardcover | 223 pages

Around the corner, underneath the tarred roads and between the steel and glass buildings, is a hidden world. A world of curious mongooses and parasitic wasps, a world of sluggish lorises, seductive plants and territorial snakes, a world teeming with life, which we pass by without noticing.

In the heart of Bangalore, the oasis of greenery that is the Indian Institute of Science campus keeps this world alive and thriving. Armed with a camera, this book dives into the undergrowth to tell you, through a series of extraordinary photographs, the stories of the inhabitants of this world, the stories of their secret lives.

"Secret Lives is a photographic chronicle of a part of an urban academic campus that few ever see, its wildlife. It's a visual story of how animals can and do survive and go about their lives right next to humans. But the photographs are only the beginning and each one is placed in the context of current ideas in ecology, evolutionary biology and wildlife conservation."

--*The Independent Photo Book*

The book is very well produced, and much more than a pretty coffee-table book. I'd say it is essential, not just for anyone who loved the IISc campus, but anyone who wants to know what sort of wildlife may be found within city limits in India.

--**Rahul Siddharthan**

"...the book is a fabulous one. The photographs are superb. I greatly appreciate the talent and dedication behind the work...I congratulate the Indian Institute of Science and those behind the actual production of the book for the high quality of the product".

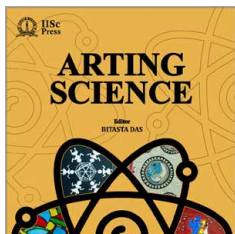
- **RJ Ranjit Daniels**, *Current Science*, Vol.97, No. 6, 25 September 2009

"...the former doctoral student with CES, Natasha Mhatre's captures its creatures great and small in her book *Secret Lives*".

- *The Hindu*

"The book featured some great pictures of various birds and mammals. One would wonder if these were living in IISc. Sharp pictures portraying their life along with some macros which had great details".

- **Anonymous user review**, Google Books



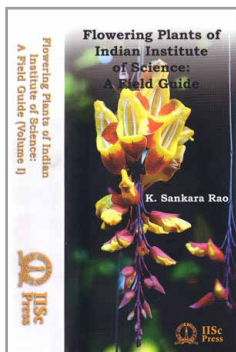
Arting Science

- Edited by BITASTA DAS, Indian Institute of Science, Bengaluru

Price: INR 300

First published in 2016 | Hardcover | 48 pages

This book brings forth the artistic genre that the students have generated-a synergy between Science and Indian Folk Arts. Every year in this course, a different art form is discussed, visual, narrative or performative. 2012-2016 was the first batch of students to be introduced to this course. The emphasis of the assignments, every year, is to push disciplinary boundaries in order to explore newer and dynamic frontiers of knowledge.



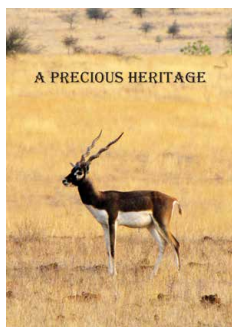
Flowering Plants of Indian Institute of Science: A Field Guide (Vol. I & II)

- K. SANKARA RAO, Indian Institute of Science, Bengaluru

Price: INR 2100 (for a set of two)

First published in 2009 | Paperback | 950 pages

This field guide contains 700 and odd taxa in two volumes with images. The author has organized plants found on IISc campus by their habit and structure. Trees, shrubs and herbs, which make up the bulk of the entries in the book, are divided in two volumes.



A Precious Heritage

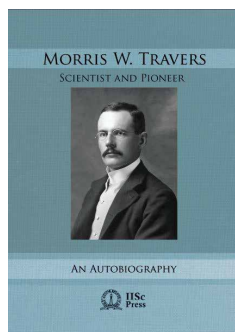
Rapid Biodiversity Survey of the Kudapura Campus, Challakere

- ROHINI BALAKRISHNAN, Indian Institute of Science, Bengaluru

Price: INR 65

First published in 2012 | Paperback | 33 pages

This booklet is an outcome of a survey taken by a team of volunteers from IISc's Centre for Ecological Sciences (CES). It documents the flora and fauna found on the new campus of the Indian Institute of Science in Challakere located in district Chitradurga, some 225 kilometers away from its Bangalore campus.



Biographies : Morris W. Travers: Scientist and Pioneer

An Autobiography

- Edited by DAVID M. W. TRAVERS and JOHN R. AINSLIE

ISBN 978-81-925707-3-0 | Price: INR 1200

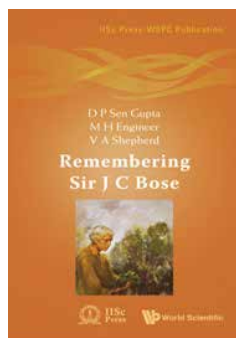
First published in 2017 | Hardcover | 470 pages

"...visually attractive, readable and accessible..."

- **Ramachandra Guha**, Historian

"IISc founding director's autobiography offers a rare glimpse into the past"

- **Divya Shekhar**, *The Economic Times*, 20 February 2017



Biographies : Remembering Sir J C Bose

- D. P. SENGUPTA, National Institute of Advanced Studies, Bengaluru

- M.H. ENGINEER, Bose Institute, Kolkata

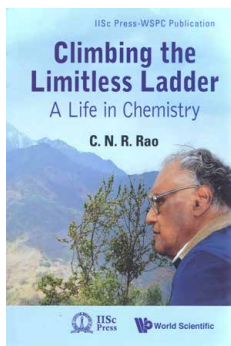
- V.A. SHEPHERD, University of South Wales, Sydney, Australia

ISBN 978-981-4271-61-5 | Price: INR 1395, \$61

First published in 2009 | Hardcover | 224 pages

Co-publisher: World Scientific Publishing Company

This book covers Bose's life in colonial India, including the general patriotic environment that pervaded at the time and how he became one of the flag bearers of the Bengal Renaissance. It also examines the scientific achievements of this polymath and his contributions to physics and plant electrophysiology, while highlighting his philosophy of life.



Biographies : Climbing the Limitless Ladder: A Life in Chemistry

- CNR RAO, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru

ISBN 978-981-4307-86-4 | Price: INR 695, \$31

First published in 2010 | Paperback | ix+222 pages

Co-publisher: World Scientific Publishing Company

"Reading his autobiography, what come out clear as the message is: "doing science is a way of life".

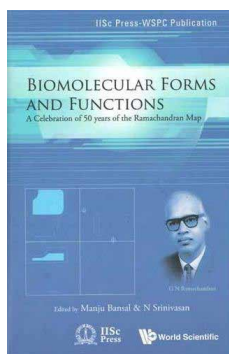
- **D. Balasubramanian**, *The Hindu*, August 25, 2010

"Rao's autobiography titled 'Climbing the Limitless Ladder: A Life in Chemistry' is worth reading by every aspiring scientist and all those interested in scientific research and education".

- **Subhodh Mahanti**, *Dream 2047*, Vol. 16, No. 6, March 2014

"This highly readable autobiography establishes that although Rao has already scaled many a pinnacle in his field of research, he is not inclined to cease his labour. Indeed, now he gazes at other and greater heights".

- **Palle Rama Rao**, former secretary, Department of Science and Technology, and former chairman, Atomic Energy Regulatory Board, *Business Standard*, September 23, 2010



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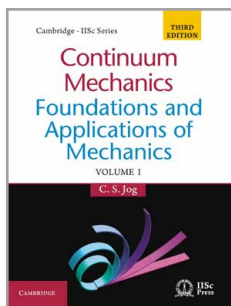
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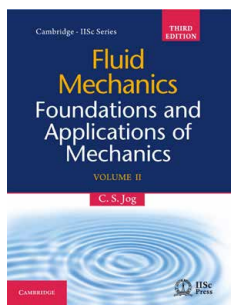
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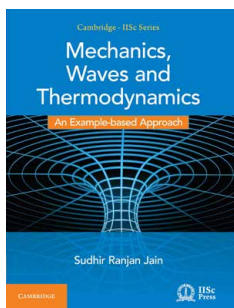
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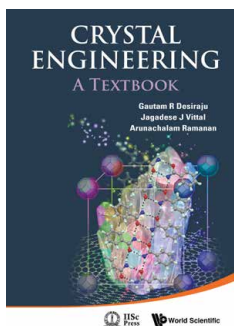
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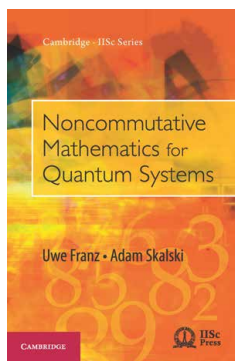
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- **Dario Braga**, Department of Chemistry, University of Bologna (Italy), *Angew. Chem. Int. Ed.* 51, 3516, 2012



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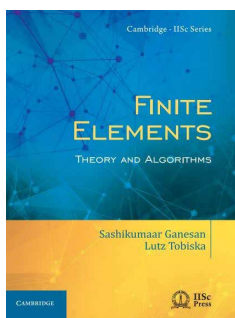
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This book will be useful to students and researchers in noncommutative probability, mathematical physics and operator algebras.



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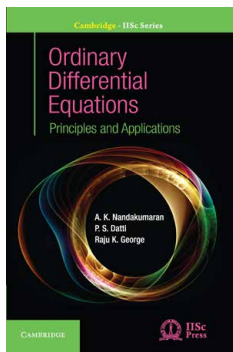
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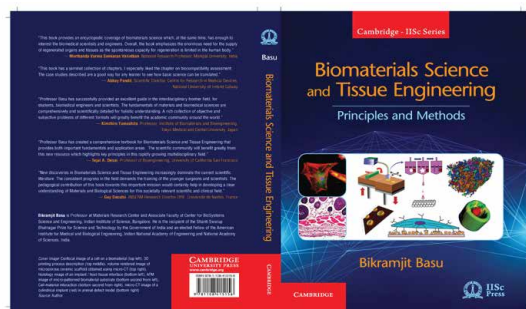
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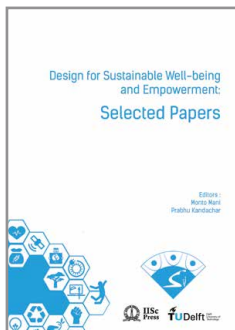
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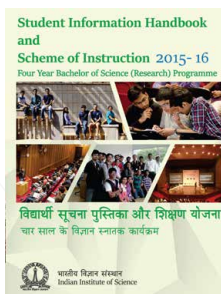
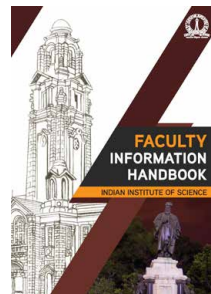
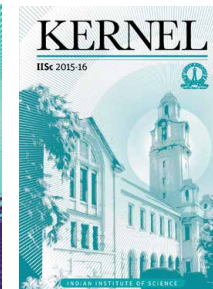
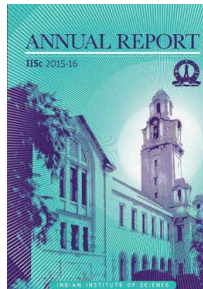
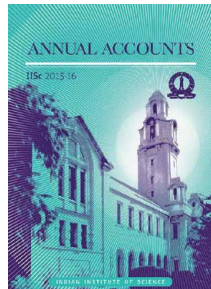
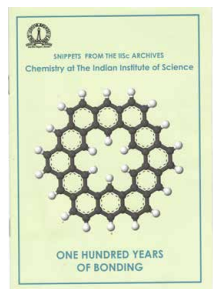
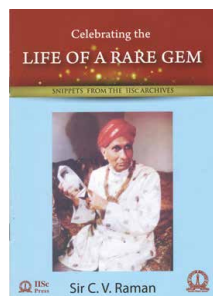
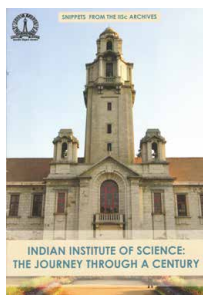
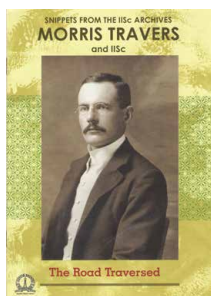
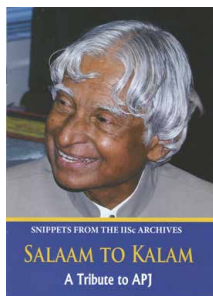
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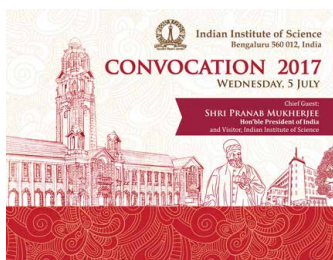
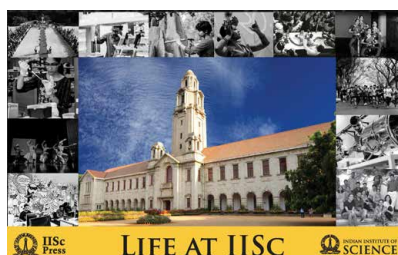
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