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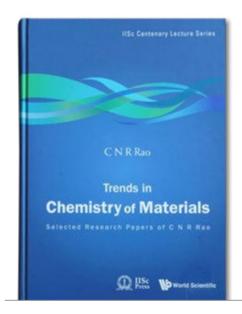
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- Science and Sustainable Food Security
- Watching Ultrafast Molecular Motions With 2D IR Chemical Exchange Spectroscopy
- Tailoring Surfaces

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Trends in Chemistry of Materials

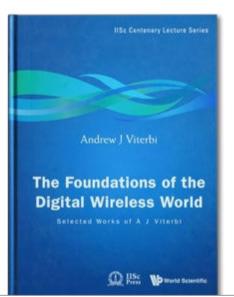
Selected Research Papers of C. N. R. Rao

ISBN 978-981-283-383-9 Price: INR 12,171

C. N. R. RAO, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru

This book presents a selection of research articles of Prof. C. N. R. 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

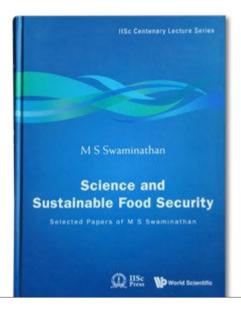
Selected Works of A. J. Viterbi

ISBN 978-981-4287-50-0 Price: INR 6,806

ANDREW J. VITERBI, University of Southern California

This volume has been compiled from the manuscripts of the Centenary Lecture by A. J. 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

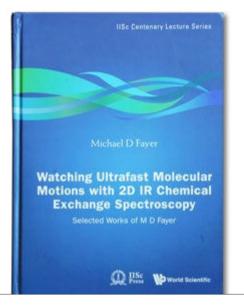
Selected Works of M. S. Swaminathan

ISBN 978-981-4355-62-9 Price: INR 8,888

M. S. SWAMINATHAN, M S Swaminathan Research Foundation, Chennai

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.





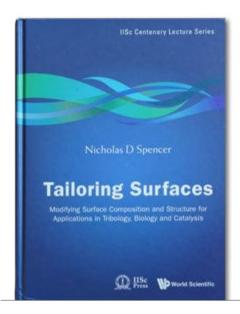
Watching Ultrafast Molecular Motions with 2D IR Chemical Exchange Spectroscopy

Selected Works of M. D. Fayer

ISBN 978-981-4355-62-9 Price: INR 13, 612

MICHAEL D. FAYER, Stanford University

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

ISBN 978-981-4289-42-9 Price: INR 13,612

NICHOLAS D. SPENCER, ETH Zurich

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, superhydrophobocity and polymer coatings.

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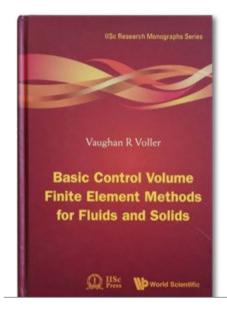
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- Aqueous Lubrication Natural and Biometric Approaches

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- Nicholas D Spencer

SERIES EDITOR
Prof. Prabal Maiti



Basic Control Volume Finite Element Methods for Fluids and Solids

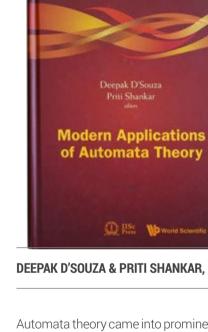
ISBN 978-981-283-498-0 Price: INR 4.323

VAUGHAN R. VOLLER, University of Minnesota

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.



+ 656 pages | Co-publisher: World Scientific Publishing Company



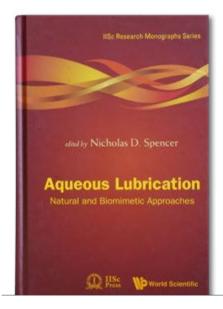
Modern Applications of Automata Theory

ISBN 978-981-4271-04-2 Price: INR 13,012

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

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 intermediatelevel 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

ISBN 978-981-4313-76-6 Price: INR 9,208

NICHOLAS D. SPENCER, ETH Zurich

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 suchas

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.

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OUTCOME

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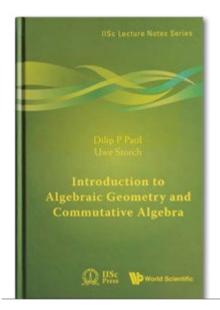
TITLES PUBLISHED

- Introduction to Algebric Geometry and Commutative Algebra
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- Introduction to Pattern Recognition and Machine Learning
- Game Theory and Mechanism Design
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Introduction to Algebraic Geometry and Commutative

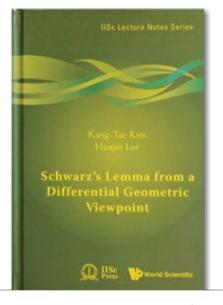
ISBN 978-981-4304-56-6 Price: INR 5,845

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

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.



82 pages | Co-publisher: World Scientific Publishing Company



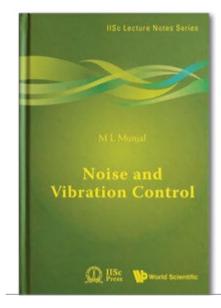
Schwarz's Lemma from a Differential Geometric Viewpoint

ISBN 978-981-4324-78-6 Price: INR 4,003

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

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

ISBN 978-981-4434-73-7 Price: INR 4,404

M. L. MUNJAL, Indian Institute of Science, Bengaluru

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.



M. Narasimha Murty V. Susheela Devi Introduction to Pattern Recognition and Machine Learning

Introduction to Pattern Recognition and Machine Learning

ISBN 978-981-4525-04-6 Price: INR 11,850

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

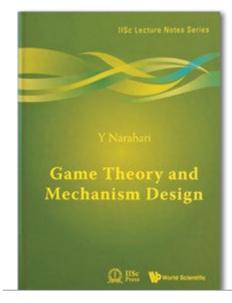
This book adopts a detailed and methodological algorithmic approach to explain the concepts of pattern recognition. While the text provides a systematic account of its major topics such as pattern representation and nearest neighbour based classifiers, current topics — neural networks, support vector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

~ P. S. Sastry,

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



Game Theory and Mechanism Design

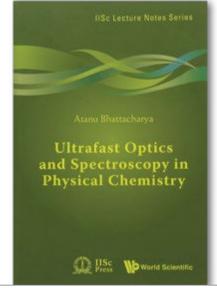
ISBN 978-981-4525-04-6 Price: INR 11,850

Y. NARAHARI, Indian Institute of Science, Bengaluru

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.



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Ultrafast Optics and Spectroscopy in Physical Chemistry

ISBN 978-981-3223-67-7 Price: INR 9,448

ATANU BHATTACHARYA, Indian Institute of Science, Bengaluru

The primary goal of this text book is to ensure that any physical science student, even one who has never heard of the subject, should be able to learn what ultrafast spectroscopy is, why optics related to the subject requires special attention, how to use the basic ideas of the subject in laboratory-based ultrafast spectroscopy experiments, how to interpret the experimental observations and so on. This book gives a more than adequate introduction to mathematical representation of an ultrafast pulse, chirp, time-band width product, nonlinear optical effects, dispersion effects, construction of ultrafast laser, ultrafast measurement techniques and different ultrafast processes of chemical interest.

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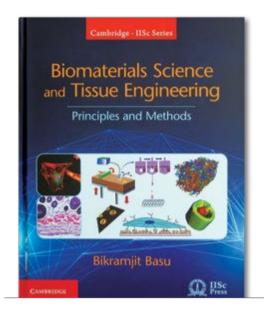
- Biomaterials Science and Tissue Engineering: Principles and Methods
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Biomaterials Science and Tissue Engineering

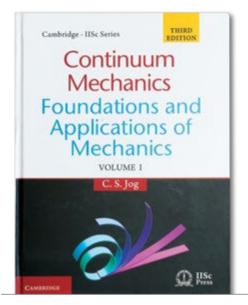
Principles and Methods

ISBN 978-110-8415-15-6 Price: INR 991

BIKRAMJIT BASU, Indian Institute of Science, Bengaluru

A comprehensive text in the field ofbiomaterials science and tissue engineering, covering fundamental principles and methods related to processing-microstructure-property linkages as applied to biomaterials science. Essential concepts and techniques of the cell biology are discussed in detail, with a focus quantitatively and qualitatively evaluating cell-material interaction. It gives detailed discussion on the processing, structure and properties of metals, ceramics and polymers, together with techniques and quidelines. Comprehensive

coverage of in vitro and in vivo biocompatibility property evaluation of materials for bone, neural as well as cardiovascular tissue engineering applications, together with representative protocols. Supported by several multiple-choice questions, fill in the blanks, review questions, numerical problems and solutions to selected problems, this is an ideal text for undergraduate and graduate students in understanding fundamental concepts and the latest developments in the field of biomaterials science.



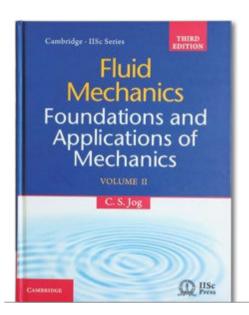
Continuum Mechanics: Foundations and Applications of Mechanics

Volume I

ISBN 978-1-107-09129-0 Price: INR 3,400

CHANDRASHEKHAR S. JOG, Indian Institute of Science, Bengaluru

Continuum mechanics studies the foundations of deformable body mechanics from a mathematical perspective. It also acts as a base upon which other applied areas such as solid mechanics and fluid mechanics are developed. This book discusses some important topics, which have come into prominence in the latter half of the twentieth century, such as material symmetry, frame-indifference and thermomechanics. The study begins with the necessary mathematical background in the form of an introduction to tensor analysis followed by a discussion on kinematics, which deals with purely geometrical notions such as strain and rate of deformation. Moving on to derivation of the governing equations, the book also presents applications in the areas of linear and nonlinear elasticity. In addition, the volume also provides a mathematical explanation to the axioms and laws of deformable body mechanics, and its various applications in the field of solid mechanics.



Fluid Mechanics: Foundations and **Applications of Mechanics**

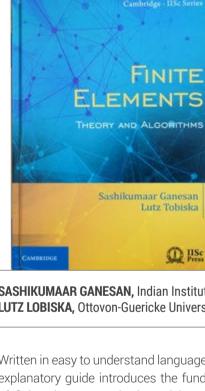
Volume II

ISBN 978-1-107-09129-0 Price: INR 1.090

CHANDRASHEKHAR S. JOG, Indian Institute of Science, Bengaluru

This book discusses the subject of fluid mechanics in detail, and provides an in-depth treatment of the governing equations and engineeringrelated applications. This volume starts by presenting a detailed summary of the governing equations including kinematics and balance laws. In presenting this summary, particular emphasis is placed on relatively recent topics such as restrictions imposed by the second law of thermodynamics, material frame-indifference, etc. It then shows how the equations for a wide range of important topics such as idea fluid flow, surface waves, laminar incompressible and compressible flows, low Reynolds number hydrodynamics, etc. can be derived by making suitable approximation to the most general form of the governing equations presented at the outset. The theory in each chapter is illustrated by considering a number of examples and engineering-related applications. number of advanced topics such as analytical solutions to steady and transient flows of incompressible fluids, and to the acoustic wave equation are covered in this book.

SBN 978-1-108-41570-5 | Hardback | Price: INR 550 | First published



Finite Elements

Theory and Algorithms

ISBN 978-1-108-41570-5 Price: INR 550

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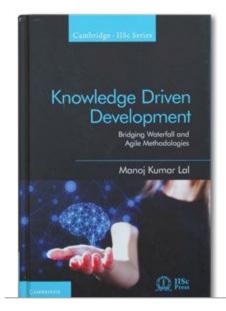
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FINITE

Sashikumaar Ganesan Lutz Tobiska

Written in easy to understand language, this selfexplanatory guide introduces the fundamentals of finite element methods and its application to differential equations. Beginning with a brief introduction to Sobolev spaces and elliptic scalar problems, the text progresses through an explanation of finite element spaces and estimates for the interpolation error. The concepts of finite element methods for parabolic scalar parabolic problems, object-oriented finite element algorithms, efficient implementation

techniques, and high dimensional parabolic problems are presented in different chapters. Recent advances in finite element methods, including non-conforming finite elements for boundary value problems of higher order and approaches for solving differential equations in high dimensional domains are explained for the benefit of the reader. Numerous solved examples and mathematical theorems are interspersed throughout the text for enhanced learning.



Knowledge Driven Development

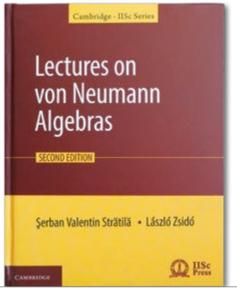
Bridging Waterfall and Agle Methodologies

ISBN 978-110-8475-21-1 Price: INR 701

MANOJ KUMAR LAL, Tata Consultancy Services, Bengaluru

Useful text in the field of computer science, providing a different methodology in the project knowledge management domain for keeping the documents updated. The methodology known as Knowledge Driven Development is exhaustive, structured and flexible as compared to other techniques.





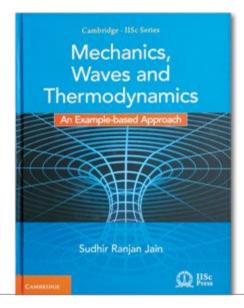
Lectures on von Neumann Algebras

Second Edition

ISBN 978-110-8654-97-5 Price: INR 660

SERBAN VALENTIN STRATILA, Institute of Mathematics of the Romanian Academy, Romania **LASZLO ZSIDO**, University of Rome Tor Vergata, Italy

Written in lucid language, this valuable text discusses fundamental concepts of von Neumann algebras including bounded linear operators in Hilbert spaces, finite von Neumann algebras, linear forms on algebra of operators, geometry of projections and classification of von Neumann algebras in an easy to understand manner. The revised text covers new material including the first two examples of factors of type II^1, an example of factor of type III and theorems for von Neumann algebras with a cyclic and separating vector. Pedagogical features including solved problems and exercises are interspersed throughout the book.



Mechanics, Waves and **Thermodynamics**

An Example-based Approach

ISBN 978-1-107-14519-1 Price: INR 625

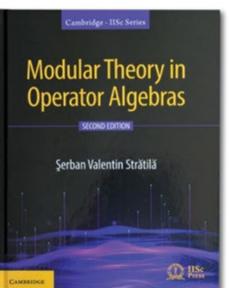
SUDHIR RANJAN JAIN, Homi Bhabha Atomic Research Centre, Mumbai

This book presents the fundamental concepts of classical physics in a coherent and logical manner. Besides elaborating the basic concepts of energy, mass, momentum and entropy, it also discusses topics like mechanics of single particle. oscillations and waves to enhance learners' understanding. The unique feature of this book lies in the discussion on concepts such as central forces in the context of a recent spacecraft landing on a comet, Caratheodory's axioms, applications of thermodynamics, understanding states of matter with the simple

usage of Boltzmann factor, which are generally not found in books on classical physics. The concepts are explained in detail with live examples and solved problems.

Classical theories are taught in all universities offering courses in Physics. This book is specially designed for undergraduate students of science and engineering.





Modular Theory in Operator Algebras

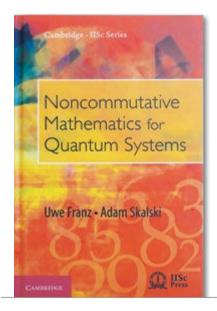
Second Edition

ISBN 978-110-489-60-7 Price: INR 818

SERBAN VALENTIN STRATILA, Romanian Academy, Romania

The text provides detailed discussion of normal weights, conditional expectations and U. Haagerup's operator-valued weights, groups of automorphisms and their spectral theory, dual theory for noncommutative groups, and crossed products of von Neumann algebras by actions of groups and dual of groups, which enable the extension of M. Takesaki duality for noncommutative groups of automorphisms. It also contains detailed discussion on the group measure space construction of factors and information about ITPFI factors and Krieger

factors. The core of the book is the continuous decomposition of A. Connes and M. Takesaki and discrete decomposition of A. Connes for type III factors. It also explores new results, such as the A. Ocneanu's result on the actions of amenable groups on the hyperfinite factor, H. Kosaki's extension of the V. Jones index to arbitrary factors and F. Radulescu's examples of non-hyperfinite factors.



Noncommutative Mathematics for Quantum Systems

ISBN 978-1-107-14805-5 Price: INR 493

UWE FRANZ, University of Franche-Comté, Besançon, France ADAM SKALSKI, Institute of Mathematics, Polish Academy of Sciences

Noncommutaitve mathematics is a significant new trend of mathematics in the twentieth century. This book is divided into two parts: first part provides an introduction to quantum probability, focusing on the notion of independence in quantum probability and on the theory of quantum stochastic processes with independent and stationary increments. The second part provides an introduction to quantum dynamical systems, discussing analogies with fundamental problems studied in classical

dynamics. The desire to build an extension of the classical theory provides new, original ways to understand well-known 'commutative' results. On the other hand, the richness of the quantum mathematical world presents completely novel phenomenon, never encountered in the classical setting.

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



Notes on The Brown-Douglas-**Fillmore Theorem**

Bridging Waterfall and Agle Methodologies

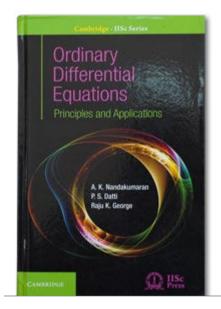
ISBN 978-1316519301 Price: INR 1.036

GADADHAR MISRA, Indian Institite of Science, Bengaluru **SAMEER CHAVAN,** Indian Institute of Technology Kanpur

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Suitable for both postgraduate students and researchers in the field of operator theory, this book is an excellent resource providing the complete proof of the Brown-Douglas-Fillmore theorem. The book starts with a rapid introduction to the standard preparatory material in basic operator theory taught at the first year graduate level course. To guickly get to the main points of the proof of the theorem, several topics that aid in the understanding of the proof are included in the appendices. These topics serve the purpose of providing familiarity with a large variety of tools used in the proof and adds to the flexibility of reading them independently.



Ordinary Dierential Equations

Principles and Applications

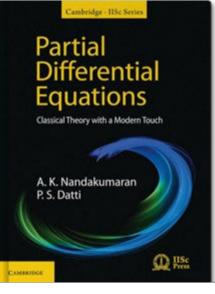
ISBN 978-1-108-41641-2 Price: INR 589

A. K. NANDAKUMARAN, Indian Institute of Science, Bengaluru
P. S. DATTI, Tata Institute of Fundamental Research, Bengaluru
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Many important real-life problems in mathematics, physics, chemistry, biology, engineering, economics, sociology and psychology are modelled using the tools and techniques of ordinary differential equations (ODEs). This book on ODE, discusses relevant topics including first and second order linear equations, initial value problems and qualitative theory. The text covers two-point boundary value problems for second order linear and nonlinear equations. Using two linearly independent solutions, a Green's function is also constructed for given boundary conditions.



pages I Co-publisher: Cambridge University Press



Partial Differential Equations

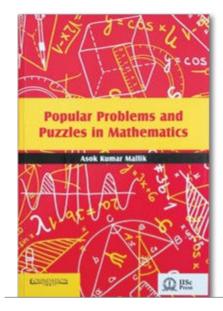
Classical Theory with a Modern Touch

ISBN 978-110-8839-80-8 Price: INR 503

A. K. NANDAKUMARAN, Indian Institute of Science, Bengaluru

P. S. DATTI, Tata Institute of Fundamental Research, Bengaluru

Suitable for both senior undergraduate and graduate students, this is a self-contained book dealing with the classical theory of the partial differential equations through a modern approach; requiring minimal previous knowledge. It represents the solutions to three important equations of mathematical physics — Laplace and Poisson equations, Heat or diffusion equation, and wave equations in one and more space dimensions. Keen readers will benefit from more advanced topics and many references cited at the end of each chapter. In addition, the book covers advanced topics such as Conservation Laws and Hamilton-Jacobi Equation. Numerous real-life applications are interspersed throughout the book to retain readers' interest.



Popular Problems and Puzzles in Mathematics

ISBN 978-93-82993-86-5 Price: INR 650

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

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 stimulatingollection provides a new twist to familiar topics that introduce unfamiliar topics.

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- Doing Science in India: My Second Innings
- Morris W. Travers: Scientist and Pioneer
- Remembering Sir J C Bose

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- Genomic Quirks: The Search for Spelling Errors
- The Story of Numbers

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- Fundamentals of Physics
- Research Methodology for Natural Sciences
- Water Futures of India

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

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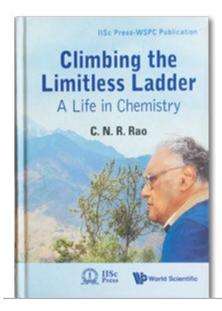
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Climbing the Limitless Ladder

A Life in Chemistry

ISBN 978-981-4307-86-4 Price: INR 695

C. N. R. RAO, Jawaharlal Nehru Centre for Advanced Scientic Research (JNCASR), Bengaluru

"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

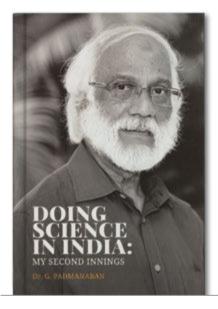
"Rao's autobiography titled 'Climbing the Limitless Ladder: A Life in Chemistry' is worth reading by every aspiring scientist and all those interested in scientific research and education".

- 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





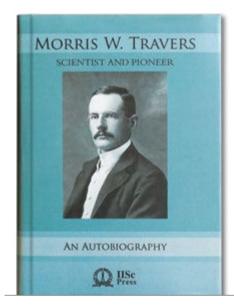
Doing Science in India

My Second Innings

ISBN 978-819-2570-75-4 Price: INR 799

G. PADMANABHAN, Indian Institute of Science, Bengaluru

In this memoir, well-known Indian biochemist and biotechnologist, G. Padmanabhan traces his jurney, growth and evolution as a scientist from being- a student of the Indian Institute of Science (IISc), Bengaluru to-becoming the Director of hs alma mater in 1994. This book is an autobiographical account of his key scientific achievements and developments that took place in 2000. This book can be considered as a sequel to The Reach the Star or Dig the Earth: My Journey through Doing Science in India published by Vigyan Prasar in 2009.



Morris W. Travers

Scientist and Pioneer

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

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

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

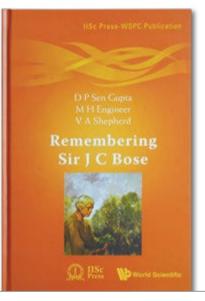
~ Ramachandra Guha, Historian

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

~ Divya Shekhar, The Economic Times, 20 February 2017



Hardback | First published in 2009 | 224 pages | Co-publisher: World Scientific Publishing Company

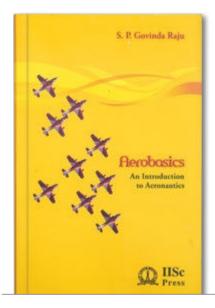


Remembering Sir J C Bose

ISBN 978-981-4271-61-5 Price: INR 1,395

D. P. SENGUPTA, National Institute of Advanced Studies, Bengaluru
 M. H. ENGINEER, Bose Institute, Kolkata
 V. A. SHEPHERD, University of South Wales, Sydney, Australia

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.



Aerobasics

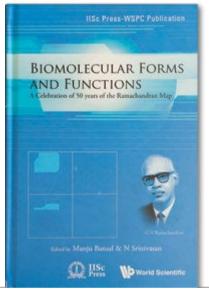
An Introduction to Aeronautics

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

S. P. GOVINDA RAJU, Indian Institute of Science, Bengaluru

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.





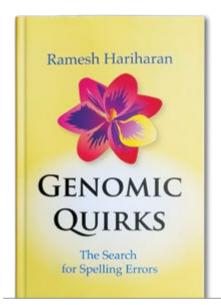
Biomolecular Forms and Functions

A Celebration of 50 years of the Ramachandran Map

ISBN 978-981-4449-13-7 Price: INR 10,540

Edited by MANJU BANSAL, Indian Institute of Science, Bengaluru & N SRINIVASAN

Understanding the functions and properties of molecules in living systems requires a detailed knowledge of their three-dimensional structures and the conformational variability that allows them to adopt multiple functional forms. Interpreting biological systems in the language of three-dimensional structures is of fundamental importance and innumerable research groups around the world are working in this area. This book is a compilation of articles describing attempts at understanding the intricacies of biological systems through the structures of and interactions between their constituent molecules.



Genomic Quirks

The Search for Spelling Errors

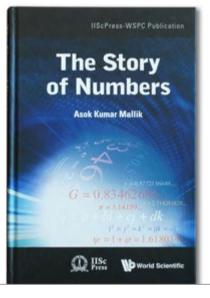
ISBN 978-935-2657-45-2 Price: INR 2.099

RAMESH HARIHARAN, Indian Institute of Science, Bengaluru

This is a book of real stories about the search for genomic spelling errors that have stark consequences — infants who pass away mysteriously, siblings with misplaced organs, a family with several instances of vision loss, sisters whose hearts fail in the prime of their youth, a boy whose blood can't carry enough oxygen, a baby with cancer in the eye, a middle-aged patient battling cancer, and the author's own color blindness. The search in each case proves to be a detective quest that connects the world of medical practice with that of molecular biology, traversing the world of computer algorithms along the way.



Hardback | First Published in 2017 | 196 pages | Co-Publisher: World Scientific Publishing Company

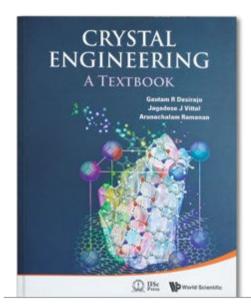


The Story of Numbers

ISBN 978-9813222922 Price: INR 1,144

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

The reader will get a glimpse of the thought process behind the invention of new mathematics. Starting from natural numbers, the book discusses integers, real numbers, imaginary and complex numbers and some special numbers like quaternions, dual numbers and p-adic numbers. Real numbers include rational, irrational and transcendental numbers. Iterations on real numbers are shown to throw up some unexpected behavior, which has given rise to the new science of 'Chaos'. Special numbers like e, pi, golden ratio, Euler's constant, Gauss's constant, amongst others, are discussed in great detail. The origin of imaginary numbers and the use of complex numbers constitute the next topic. It is shown why modern mathematics cannot even be imagined without imaginary numbers.



Crystal Engineering

ISBN 978-981-4271-61-5 Price: INR 1,395

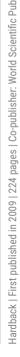
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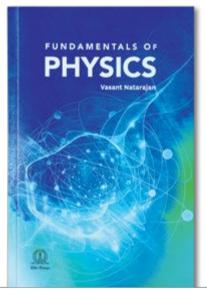
JAGADESE J. VITTAL, National University of Singapore, Singapore

AUNACHALAM RAMANAN, Indian Institute of Technology, Delhi

"This year I was very happy when at last I could tell my students that a book on crystal engineering is available for their studies."

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



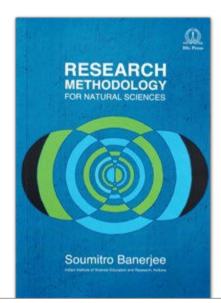


Fundamentals of Physics

ISBN 978-81-925707-9-2 Price: INR 500

VASANT NATARAJAN, Indian Institute of Science, Bengaluru

Human beings by nature are curious and science helps to appease our inquisitiveness. The understanding of basic physics is foremost in the modern world leading to advancement in science and technology perpetually. This book provides an insight into key concepts of physics ranging from classical to quantum mechanics and introducing the physics behind everyday technologies of AC, refrigerators, wireless communication, CCD camera, etc. The beauty of the book lies in the fact that it makes the learning of physics enthralling without going into much of the mathematics. For those who are mathematically inclined, each chapter is followed by a set of problems that deepen the ideas introduced in the chapter and helps make connections between basic physics and seemingly advanced concepts.



Research Methodology for Natural Sciences

ISBN 978-81-948351-7-2 Price: INR 800

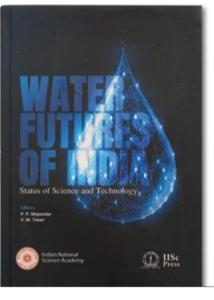
SOUMITRO BANERJEE, Indian Institute of Science Education and Research, Kolkata

This book introduces budding scientists to the method of science. Science tries to find out the laws governing the material world and explain various natural events and phenomena following a definite methodology: proposing hypotheses and postulates and accepting or rejecting these based on evidence. This book contains a step-by-step exposition of the method.

The book begins with philosophical issues like subjective versus objective thinking, materialism versus idealism, logical reasoning, causality etc. Then the methodological issues in proposing and testing hypotheses and postulates, making measurements, and conducting theoretical research are covered. The third part deals with the ethics of science and the art of scientific communication.

Hardback | First published in 2022 | 254 pages





Water Futures of India

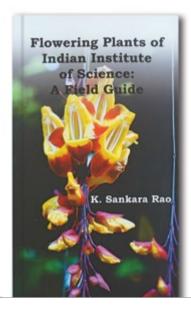
Status of Science and Technology

ISBN 978-819-3948-20-0 Price: INR 2.025

P. P. MUJUMDAR, Indian Institute of Science, BengaluruV. M. TIWARI, National Geophysical Research Institute, Hyderabad

Water Futures of India: Status of Science and Technology is the result of an Indian National Science Academy (INSA) initiative to map the responsiveness of India's science and technology to an impending water crisis. With contributions from eminent scientists and practitioners, the focus of the book is on science and technology issues; additionally, chapters also typically address relevant policy interventions. The book opens with an overview of the current status of surface and ground water resources in the

country, using data from secondary sources. Subsequent chapters cover tools for estimation, measurement and monitoring of water resources at various temporal and spatial scales. Snow and glacier hydrology, isotope techniques, groundwater prospecting and applications of remote sensing are covered in detail in individual chapters.



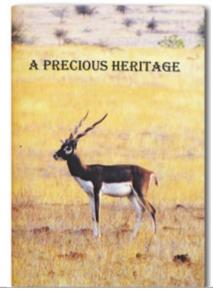
Flowering Plants of Indian Institute of Science

A Field Guide - Volume I & II

ISBN 978-81-948351-6-5 Price: INR 2,100 (for a set of two)

K. SANKARA RAO, Indian Institute of Science, Bengaluru

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.



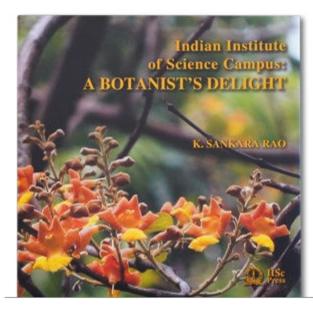
A Precious Heritage

Rapid Biodiversity Survey of the Kudapura Campus, Challakere

Price: INR 65

ROHINI BALAKRISHNAN, Indian Institute of Science, Bengaluru

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 Bengaluru campus.



A Botanist's Delight

Indian Institute of Science Campus

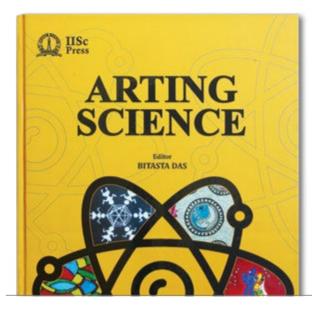
ISBN 978-81-948351-0-3 Price: INR 1,500

K. SANKARA RAO, Indian Institute of Science, Bengaluru

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





Arting Science

ISBN 978-81-925707-2-3 Price: INR 300

Edited by BITASTA DAS, Indian Institute of Science, Bengaluru

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.

[&]quot;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



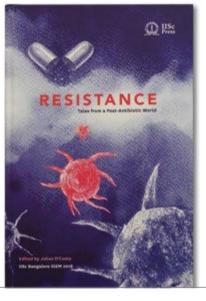
Jal Jungle Zameen

In the Age of Science and Technology

ISBN 978-819-2570-77-8 Price: INR 400

BITASTA DAS, Indian Institute of Science, Bengaluru

Traditionally, the edifice of culture has been built on its distinctiveness from nature: culture is a human institution while nature is the exterior realm; culture encompasses human-endorsed rules, values and exercise of will while nature ordains its own operation. However, most cultures have held nature in high esteem. In India, the earth has been conceived of as 'mother'. The concept of ishavasyam entails that divinity resides everywhere in nature and hence, it must be revered.



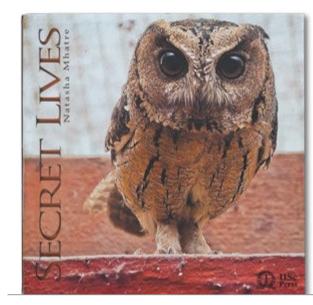
Resistance

Tales from a Post-Antibiotic World

ISBN 978-819-2570-78-5 Price: INR 390

JULIAN D'COSTA, Indian Institute of Science, Bengaluru

This book is an anthology of short fiction centered on the theme of antimicrobial resistance. As pathogenic bacteria evolve to defend themselves from the antibiotics we use and overuse - against them, this volume seeks to bring the crisis further into public consciousness with stories that illuminate, provoke, and entertain.



Secret Lives

ISBN 978-81-948351-5-8 Price: INR 1500

NATASHA MHATRE, University of Toronto, Canada

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 Bengaluru, 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.



Selected Papers

Design for Sustainable Well-being and **Empowerment**

ISBN 978-81-925707-1-6 Available as e-book only

MONTO MANI, Indian Institute of Science, Bengaluru PRABHU KANDACHAR, Delft University of Technology, Delft

Design for sustainable well-being and empowerment:

selected papers

Many important real-life problems in mathematics, physics, chemistry, biology, engineering, economics, sociology and psychology are modelled using the tools and techniques of ordinary differential equations (ODEs). This book on ODE, discusses relevant topics including first and second order linear equations, initial value problems and qualitative theory. The text covers two-point boundary value problems for second order linear and nonlinear equations. Using two linearly independent solutions, a Green's function is also constructed for given boundary conditions.

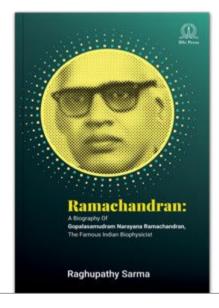
FORTHCOMING BOOKS

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- Ramachandran:
 A Biography of
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 Narayana Ramachandran,
 The Famous Indian
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- The Computation Meme: Computational Thinking in the India Tradition
- On the Web with Spiders: Handbook with Field Notes

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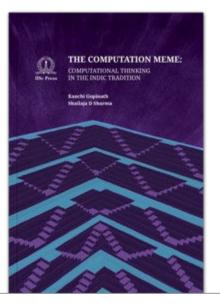
Ramachandran

A Biography of Gopalasamudram Narayana Ramachandran, The Famous Indian Biophysicist (Republished)

ISBN 978-81-948351-1-0

RAGHUPATHY SARMA

Gopalasamudram Narayana Ramachandran is known as the "Father of Molecular Biophysics in India". His work is preeminent in the study of protein structures. His discovery has laid the foundation for initiating a new field of study on conformations of macromolecules. He has left a permanent imprint with the "Ramachandran Phi-Psi Plot" or the "Ramachandran diagram". It has become a standard description in every modern publication on protein structures. This book is the reprint of the original published by Adenine Press in 1998. It presents a biographical sketch of this exceptional luminary and traces his brilliant scientific career along with the setbacks and triumphs.



The Computation Meme

Computational Thinking in the Indic Tradition

ISBN 978-81-948351-8-9

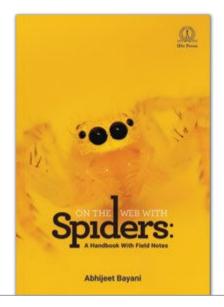
KANCHI GOPINATH AND SHAILAJA D SHARMA

Computational thinking has been a prominent theme in the Indic view of reality since very early times. It is not surprising therefore that drk. ganitaikya (ज्ञापिर) or "computational positivism" as Roddam Narasimha has characterised it) has informed many disciplines in India such as astronomy and grammar. The key principle here is the correspondence between observations and computations.

The Indic position, which is based on

computational models, has not received due recognition because of the hitherto dominant paradigm of deductive mathematics. Nowadays, the computational model has significant adherents, whether in computational fluid mechanics, biology, finance, etc. The articles in this volume illustrate the computational perspective in diverse Indic domains. We hope this volume opens a healthy debate on the continued relevance of the Indic perspectives on understanding the world.





On the Web with **Spiders**

Handbook with Field Notes

ISBN 978-81-948351-9-6

ABHIJEET BAYANI

Spider diversity in India is unique, fascinating, but understudied. This handbook on common spiders of India provides a fresh perspective on life history, behaviour, natural history, and conservation through first-hand (unpublished) scientific field notes collected over the last 15 years. The book also simplifies the identification through illustrations and numerous images of spiders from different angles. The individual spider description uses terms that can be easily understood by an amateur yet does not make it redundant for an expert. This book would act as a field guide and be helpful in the laboratory for the students. Ultimately, this volume aims to kindle curiosity in all the readers, enabling them to observe spiders more intently.

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