Problems Of The Mathematical Theory Of Plasticity Springer

Second edition sold 2241 copies in N.A. and 1600 ROW. New edition contains 50 percent new material.

Knots are familiar objects. We use them to moor our boats, to wrap our packages, to tie our shoes. Yet the mathematical theory of knots quickly leads to deep results in topology and geometry. The Knot Book is an introduction to this rich theory, starting from our familiar understanding of knots and a bit of college algebra and finishing with exciting topics of current research. The Knot Book is also about the excitement of doing mathematics. Colin Adams engages the reader with fascinating examples, superb figures, and thought-provoking ideas. He also presents the remarkable applications of knot theory to modern chemistry, biology, and physics. This is a compelling book that will comfortably escort you into the marvelous world of knot theory. Whether you are a mathematics student, someone working in a related field, or an amateur mathematician, you will find much of interest in The Knot Book.

This monograph evolved over the past five years. It had its origin as a set of lecture notes prepared for the Ninth Summer School of Mathematical Physics held at Ravello, Italy, in 1984 and was further refined in seminars and lectures given primarily at the University of Colorado. The material presented is the product of a single mathematical question raised by Dave Kassoy over ten years ago. This question and its partial resolution led to a successful, exciting, almost unique interdisciplinary col laborative scientific effort. The mathematical models described are often times deceptively simple in appearance. But they exhibit a mathematical richness and beauty that belies that simplicity and affirms their physical significance. The mathe matical tools required to resolve the various problems raised are diverse, and no systematic attempt is made to give the necessary mathematical background. The unifying theme of the monograph is the set of models themselves. This monograph would never have come to fruition without the enthu siasm and drive of Dave Eberly-a former student, now collaborator and coauthor-and without several significant breakthroughs in our understand ing of the phenomena of blowup or thermal runaway which certain models discussed possess. A collaborator and former student who has made significant contribu tions throughout is Alberto Bressan. There are many other collaborators William Troy, Watson Fulks, Andrew Lacey, Klaus Schmitt-and former students-Paul Talaga and Richard Ely-who must be acknowledged and thanked.

Theory of Elasticity

Old and New Unsolved Problems in Plane Geometry and Number Theory

Lectures on Mathematical Theory of Extremum Problems

An Elementary Introduction to the Mathematical Theory of Knots

The Mathematical Theory of Coding

Author's index and references

Scientific knowledge grows at a phenomenal pace--but few books have had as lasting an impact or played as important a role in our modern world as The Mathematical Theory of Communication, published originally as a paper on communication theory more than fifty years ago. Republished in book form shortly thereafter, it has since gone through four hardcover and sixteen paperback printings. It is a revolutionary work, astounding in its foresight and contemporaneity. The University of Illinois Press is pleased and honored to issue this commemorative reprinting of a classic.

A rigorous and thorough mathematical introduction to the subject; A clear and concise treatment of modern fast solution techniques such as multigrid and domain decomposition algorithms; Second edition contains two new chapters, as well as many new exercises; Previous edition sold over 3000 copies worldwide

An Introduction to the Mathematical Theory of Inverse Problems

Mathematical Theory of Reliability

An Introduction to the Mathematical Theory of the Navier-Stokes Equations

Some Basic Problems of the Mathematical Theory of Elasticity

The Mathematical Theory of Finite Element Methods

TO THE FIRST ENGLISH EDITION. In preparing this translation, I have taken the liberty of including footnotes in the main text or inserting them in small type at the appropriate places. I have also corrected minor misprints without special mention .. The Chapters and Sections of the original text have been called Parts and Chapters respectively, where the latter have been numbered consecutively. The subject index was not contained in the Russian original and the authors' index represents an extension of the original list of references. In this way the reader should be able to find quickly the pages on which anyone reference is discussed. The transliteration problem has been overcome by printing the names of Russian authors and journals also in Russian type. While preparing this translation in the first place for my own informa tion, the knowledge that it would also become accessible to a large circle of readers has made the effort doubly worthwhile. I feel sure that the reader will share with me in my admiration for the simplicity and lucidity of presentation.

Turbulence is a major problem facing modern societies. It makes airline passengers return to their seats and fasten their seatbelts but it also creates drag on the aircraft that causes it to use more fuel and create more pollution. The same applies to cars, ships and the space shuttle. The mathematical theory of turbulence has been an unsolved problems for 500 years and the development of the statistical theory of the Navier-Stokes equations describes turbulent flow has been an open problem. The Kolmogorov-Obukhov Theory of Turbulence develops a *statistical theory of turbulence from the stochastic Navier-Stokes equation and the physical theory, that was proposed by Kolmogorov and Obukhov in 1941. The statistical theory of turbulence shows that the noise in developed turbulence is a general form which can be used to present a mathematical model for the stochastic Navier-Stokes equation. The statistical theory of the stochastic Navier-Stokes equation is developed in a pedagogical manner and shown to imply the Kolmogorov-Obukhov statistical theory. This book looks at a new mathematical theory in turbulence which may lead to many new developments in vorticity and Lagrangian turbulence. But even more importantly it may produce a systematic way of improving direct Navier-Stokes simulations and lead to a major jump in the technology both preventing and utilizing turbulence.*

Linear and nonlinear waves are a central part of the theory of PDEs. This book begins with a description of one-dimensional waves and their visualization through computer-aided techniques. Next, traveling waves are covered, such as solitary waves for the Klein-Gordon and KdV equations. Finally, the author gives a lucid discussion of waves arising from conservation laws, including shock and rarefaction waves. As an application, interesting models of traffic flow are used to illustrate conservation laws and wave phenomena. This book is based on a course given by the author at the IAS/Park City Mathematics Institute. It is suitable for independent study by undergraduate students in mathematics, engineering, and science programs. This book is published in cooperation with IAS/Park City Mathematics Institute.

A Mathematical Theory of Turbulence

General Problems in the Mathematical Theory of Investment Arising in Irrigation Projects

Some Problems in the Mathematical Theory of Elasticity

An Introduction

Being an Attempt to Employ Certain Mathematical Principles in the Elucidation of Some Metaphysical Problems

Excerpt from Problems in the Mathematical Theory of Investment When my book on The Mathematical Theory of In vestment was written, considerable difficulty was experi enced in finding a sufficient number of practical problems with which to illustrate the theory. As every teacher of elementary mathematics knows, solutions of the problems in any book that is used from year to year soon become current among the student body, so that the usefulness of a limited book list is to a large extent destroyed. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Number theory is an important research field of mathematics. In mathematical competitions, problems of elementary number theory occur frequently. These problems use little knowledge and have many variations. They are flexible and diverse. In this book, the author introduces some basic concepts and methods in elementary number theory via problems in mathematical competitions. Readers are encouraged to try to solve the problems by themselves before they read the given solutions of examples. Only in this way can they truly appreciate the tricks of problem-solving.

This graduate-level textbook introduces the reader to the area of inverse problems, vital to many fields including geophysical exploration, system identification, nondestructive testing, and ultrasonic tomography. It aims to expose the basic notions and difficulties encountered with ill-posed problems, analyzing basic properties of regularization methods for ill-posed problems via several simple analytical and numerical examples. The book also presents three special nonlinear inverse problems in detail: the inverse spectral problem, the inverse problem of electrical impedance tomography (EIT), and the inverse scattering problem. The corresponding direct problems are studied with respect to existence, uniqueness, and continuous dependence on parameters. Ultimately, the text discusses theoretical results as well as numerical procedures for the inverse problems, including many exercises and illustrations to complement coursework in mathematics and engineering. This updated text includes a new chapter on the theory of nonlinear inverse problems in response to the field's growing popularity, as well as a new section on the interior transmission eigenvalue problem which complements the Sturm-Liouville problem and which has received great attention since the previous edition was published.

Unsolved Problems in Number Theory

Issues in Mathematical Theory and Modeling: 2013 Edition

An Introduction to the Mathematical Theory of Waves

Steady-State Problems

Some basic problems of the mathematical theory of elasticity

This book provides clear presentations of more than sixty important unsolved problems in mathematical systems and control theory. Each of the problems included here is proposed by a leading expert and set forth in an accessible manner. Covering a wide range of areas, the book will be an ideal reference for anyone interested in the latest developments in the field, including specialists in applied mathematics, engineering, and computer science. The book

consists of ten parts representing various problem areas, and each chapter sets forth a different problem presented by a researcher in the particular area and in the same way: description of the problem, motivation and history, available results, and bibliography. It aims not only to encourage work on the included problems but also to suggest new ones and generate fresh research. The reader will be able to submit solutions for possible inclusion on an online version of the book to be updated quarterly on the Princeton University Press website, and thus also be able to access solutions, updated information, and partial solutions as they are developed.

The book provides a comprehensive, detailed and self-contained treatment of the fundamental mathematical properties of boundary-value problems related to the Navier-Stokes equations. These properties include existence, uniqueness and regularity of solutions in bounded as well as unbounded domains. Whenever the domain is unbounded, the asymptotic behavior of solutions is also investigated. This book is the new edition of the original two volume book, under the same title, published in 1994. In this new edition, the two volumes have merged into one and two more chapters on steady generalized oseen flow in exterior domains and steady Navier–Stokes flow in three-dimensional exterior domains have been added. Most of the proofs given in the previous edition were also updated. An introductory first chapter describes all relevant questions treated in the book and lists and motivates a number of significant and still open questions. It is written in an expository style so as to be accessible also to non-specialists.Each chapter is preceded by a substantial, preliminary discussion of the problems treated, along with their motivation and the strategy used to solve them. Also, each chapter ends with a section dedicated to alternative approaches and procedures, as well as historical notes. The book contains more than 400 stimulating exercises, at different levels of difficulty, that will help the junior researcher and the graduate student to gradually become accustomed with the subject. Finally, the book is endowed with a vast bibliography that includes more than 500 items. Each item brings a reference to the section of the book where it is cited. The book will be useful to researchers and graduate students in mathematics in particular mathematical fluid mechanics and differential equations. Review of First Edition, First Volume: "The emphasis of this book is on an introduction to the mathematical theory of the stationary Navier-Stokes equations. It is written in the style of a textbook and is essentially self-contained. The problems are presented clearly and in an accessible manner. Every chapter begins with a good introductory discussion of the problems considered, and ends with interesting notes on different approaches developed in the literature. Further, stimulating exercises are proposed. (Mathematical Reviews, 1995)

Issues in Mathematical Theory and Modeling / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Mathematical Theory and Modeling. The editors have built Issues in Mathematical Theory and Modeling: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Mathematical Theory and Modeling in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Mathematical Theory and Modeling: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Some Basic Problems of the Mathematical Theory of Elesticity. Fundamental Equations, Plane Theory of Elesticity, Torsion and Bending

Some Problems in the Mathematical Theory of Statistics

The Kolmogorov-Obukhov Theory of Turbulence

Mathematical Problems in Wave Propagation Theory

Problems in the Statistical Theory of Road Traffic

The Mathematical Theory of Coding focuses on the application of algebraic and combinatoric methods to the coding theory, including linear transformations, vector spaces, and combinatorics. The publication first offers information on finite fields and coding theory and combinatorial constructions and coding. Discussions focus on self-dual and quasicyclic codes, quadratic residues and codes, balanced incomplete block designs and codes, bounds on code dictionaries, code invariance under permutation groups, and linear transformations of vector spaces over finite fields. The text then takes a look at coding and combinatorics and the structure of semisimple rings. Topics include structure of cyclic codes and semisimple rings, group algebra and group characters, rings, ideals, and the minimum condition, chains and chain groups, dual chain groups, and matroids, graphs, and coding. The book ponders on group representations and group codes for the Gaussian channel, including distance properties of group codes, initial vector problem, modules, group algebras, andrepresentations, orthogonality relationships and properties of group characters, and representation of groups. The manuscript is a valuable source of data for mathematicians and researchers interested in the mathematical theory of coding.

Approximately 1,000 problems – with answers and solutions included at the back of the book – illustrate such topics as random events, random variables, limit theorems, Markov processes, and much more.

Victor Klee and Stan Wagon discuss some of the unsolved problems in number theory and geometry, many of which can be understood by readers with a very modest mathematical background. The presentation is organized around 24 central problems, many of which are accompanied by other, related problems. The authors place each problem in its historical and mathematical context, and the discussion is at the level of undergraduate mathematics. Each problem section is presented in two parts. The first gives an elementary overview discussing the history and both the solved and unsolved variants of the problem. The second part contains more details, including a few proofs of related results, a wider and deeper survey of what is known about the problem and its relatives, and a large collection of references. Both parts contain exercises, with solutions. The book is aimed at both teachers and students of mathematics who want to know more about famous unsolved problems.

The Mathematical Theory of Optimal Processes

Problems in the Mathematical Theory of Investment

Mathematical Problems from Combustion Theory

The Knot Book

Some Basic Problems of the Mathematical Theory of Elasticity: Fundamental Equations, Plane Theory of Elasticity, Torsion, and Bending

Following Keller [119] we call two problems inverse to each other if the for mulation of each of them requires full or partial knowledge of the other. By this definition, it is obviously arbitrary which of the two problems we call the direct and which we call the inverse problem. But usually, one of the problems has been studied earlier and, perhaps, in more detail. This one is usually called the direct problem, whereas the other is the invers problem. However, there is often another, more important difference between these two problems. Hadamard (see [91]) introduced the concept of a well-posed problem, originating from the philosophy that the mathem model of a physical problem has to have the properties of uniqueness, existence, and stability of the solution. If one of the properties fails to hold, he called the problem ill-posed. It turns out that many interesting and important inverse in science lead to ill-posed problems, while the corresponding di problems rect problems are well-posed. Often, existence and uniqueness can be forced by enlarging or reducing the solution space (t space of "models"). For restoring stability, however, one has to change the topology of the spaces, which is in many cases impossible because of the presence of measurement errors. At first glance, it seems to be im to compute the solution of a problem numerically if the solution of the problem does not depend continuously on the data, i. e. , for the case of ill-posed problems.

This monograph presents a survey of mathematical models useful in solving reliability problems. It includes a detailed discussion of life distributions corresponding to wearout and their use in determining maintenance policies, and covers important topics such as the theory of increasing (decreasing) failure rate distributions, optimum maintenance policies, and the theory of coherent systems. The emphasis throughout the book is on making minimal assumptions - and only those based on plausible physical considerations - so that the resulting mathematical deductions may be safely made about a large variety of commonly occurring reliability situations. The first part of the book is concerned with component reliability, while the second part covers system reliability, including problems that are as important today as they were in the 1960s. The enduring relev of the subject of reliability and the continuing demand for a graduate-level book on this topic are the driving forces behind its re-publication.

Problems in Set Theory, Mathematical Logic and the Theory of Algorithms by I. Lavrov & L. Maksimova is an English translation of the fourth edition of the most popular student problem book in mathematical logic in Russian. It covers major classical topics in proof theory and the semantics of propositional and predicate logic as well as set theory and computation theory. Each chapter begins with 1-2 pages of terminology and definitions that make the book self-contained. Solutions are provided. The book is likely to become an essential part of curricula in logic.

Problems in Probability Theory, Mathematical Statistics and Theory of Random Functions

Fundamental Equations, Plane Theory of Elasticity, Torsion and Bending

Unsolved Problems in Mathematical Systems and Control Theory

Some Problems in the Mathematical Theory of Thermoelasticity

This book shows clearly how the study of concrete control systems has motivated the development of the mathematical tools needed for solving such problems. In many cases, by using this apparatus, far-reaching generalizations have been made, and its further development will have an important effect on many fields of mathematics. In the book a way is demonstrated in which the study of the Watt flyball governor has given rise to the theory of stability of motion. The criteria of controllability, observability, and stabilization are stated. Analysis is made of dynamical systems, which describe an autopilot, spacecraft orientation system, controllers of a synchronous electric machine, and phase-locked loops. The Aizerman and Brockett problems are discussed and an introduction to the theory of discrete control systems is given. Contents: The Watt Governor and the Mathematical Theory of Stability of Motion; Linear Electric Circuits. Transfer Functions and Frequency Responses of Linear Blocks; Controllability, Observability, Stabilization; Two-Dimensional Control Systems. Phase Portraits; Discrete Systems; The Aizerman Conjecture. The Popov Method. Readership: Applied mathematicians and mechanical engineers.

An Introduction to the Mathematical Theory of Inverse ProblemsSpringer Science & Business Media

Issues in Mathematical Theory and Modeling / 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Lie Theory. The editors have built Issues in Mathematical Theory and Modeling: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Lie Theory in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Mathematical Theory and Modeling: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Some Basic Problems of the Mathematical

Open Problems on the Mathematical Theory of Systems : August 12-16, 2002

Issues in Mathematical Theory and Modeling: 2011 Edition

Mathematical Problems of Control Theory

Problems of Number Theory in Mathematical Competitions

Excerpt from Problems in the Mathematical Theory of Investment About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

The author of this book, Igor' Vladimirovich Girsanov, was one of the first mathematicians to study general extremum problems and to realize the feasibility and desirability of a unified theory of extremal problems, based on a functional analytic approach. He actively advocated this view, and his special course, given at the Faculty of Mechanics and Mathematics of the Moscow State University in 1963 and 1964, was apparently the first systematic exposition of a unified approach to the theory of extremal problems. This approach was based on the ideas of Dubovitskii and Milyutin [1]. The general theory of extremal problems has developed so intensely during the past few years that its basic concepts may now be considered finalized. Nevertheless, as yet the basic results of this new field of mathematics have not been presented in a form accessible to a wide range of readers. (The profound paper of Dubovitskii and Milyutin [2] can hardly be recommended for a first study of the theory, since, in particular, it does not contain proofs of the fundamental theorems.) Girsanov's book fills this gap. It contains a systematic exposition of the general principles underlying the derivation of necessary and sufficient conditions for an extremum, in a wide variety of problems. Numerous applications are given to specific extremal problems. The main material is preceded by an introductory section in which all prerequisites from functional analysis are presented.

2002 MTNS Problem Book

A Mathematical Theory of Spirit

Plane Stress Problems in the Mathematical Theory of Elasticity

Fundamental Equations; Plane Theory of Elasticity; Torsion and Bending

The Mathematical Theory of Communication