L. D. Faddeev's Seminar on Mathematical Physics - L. D. Faddeev - 2000
Professor L. D. Faddeev's seminar at Steklov Mathematical Institute (St. Petersburg, Russia) has a record of more than 30 years of intensive research for more than 200 years, there still is a broad field open for theoretical and experimental physics, including recently revealed superhydrophobic, superoleophobic and superhydrophobic surfaces, so-called liquid marbles, wetting transitions, etc. This book integrates all these aspects within a general framework of wetting of real surfaces, where physical and chemical heterogeneity is essential. Wetting of rough/heterogeneous surfaces is discussed through the use of the variational approach developed recently by the author. It allows natural and elegant grounding of main equations describing wetting of solid surfaces, i.e., Young, Wenzel and Cassie-Baxter equations. The problems of superhydrophobicity, wetting transitions and contact angle hysteresis are discussed in much detail, in view of novel models and new experimental data.

Wetting of Real Surfaces - Edward Yu. Bormashenko - 2013-03-22
The revealing of the phenomenon of superhydrophobicity (the "lotus-effect") has stimulated an interest in wetting of real (rough and chemically heterogeneous) surfaces. In spite of the fact that wetting has been exposed to intensive research for more than 200 years, there still is a broad field open for theoretical and experimental research, including recently revealed superhydrophobic, superoleophobic and superhydrophobic surfaces, so-called liquid marbles, wetting transitions, etc. This book integrates all these aspects within a general framework of wetting of real surfaces, where physical and chemical heterogeneity is essential. Wetting of rough/heterogeneous surfaces is discussed through the use of the variational approach developed recently by the author. It allows natural and elegant grounding of main equations describing wetting of solid surfaces, i.e., Young, Wenzel and Cassie-Baxter equations. The problems of superhydrophobicity, wetting transitions and contact angle hysteresis are discussed in much detail, in view of novel models and new experimental data.

Motivated by a plethora of phenomena from nature, this textbook introduces into the physics of wetting of surfaces. After a brief discussion of the foundations of surface tension, its implementation for floating objects, capillary waves, bouncing droplets, walking of water striders, etc. is discussed. Furthermore, Marangoni flows, surface tension inspired instabilities, condensation and evaporation of droplets, liquid marbles, superhydrophobicity and superoleophobicity (lotus effect) are introduced. All relevant concepts are illustrated by the numerous qualitative and quantitative exercises. Contents What is surface tension? Wetting of surfaces: the contact angle Surface tension-assisted floating of heavy and light objects and walking of water striders Capillary interactions between particles. Particles placed on liquid surfaces. Elasticity of liquid surfaces, covered by colloidal particles Capillary waves Oscillation of droplets Marangoni flow and surface instabilities Evaporation of droplets. The Kelvin and the coffee-stain effects Condensation, growth and coalescence of droplets and the breath-figure self-assembly Dynamics of wetting: bouncing, spreading and rolling of droplets (water hammer effect - water entry and drag-out problems)Superhydrophobicity and superoleophobicity: the Wenzel and Cassie wetting regimes The Leidenfrost effect. Liquid marbles: self-propulsion Physics, geometry, life and death of soap films and bubbles

Bilinear Integrable Systems: from Classical to Quantum, Continuous to Discrete - Ludwig Faddeev - 2007-05-16
On April 29, 1814 Napoleon landed on the island of Elba, surrounded with a personal army of 1200 men. The allies, Russia, Prussia, England and Austria, hadforcedhimintowitlessderanumberofverycostlydefeats;hesawdeprived ofallhappiness, butcouldkeepthethitler"EmperorofElba". Historytellsusthat each morning he took long walks in the sun, reviewed his army each midday and discussed worldmatterswithhispointedadvisors, followingthesame pattern everyday, to the great surprise of Campbell, the British oficer who was to keep an eye on him. All this made everyone believe he was settled there for good. Napoleononcesaid:Elbaaisbeautifull, butitsbadmail. Elbadwaste?
A.P. Protogenov -- Compatible nonlocal Poisson brackets of hydrodynamic type and integrable reductions of the
woken up by one of his aides with the stunning news that Napoleon had left Elba with his 1200 men and was
marching to Paris with little resistance; A few days later he took up his throne again in the Tuileries. In spite of
his insatiable hunger for battles and expansion, he is remembered as an important statesman. He was a pioneer in
setting up much of the legal, administrative and political machinery in large parts of continental Europe. We
gathered here in a lovely and quaint?shing port, Mariciana Marina on theisland of Elba,
tcoeleteam on the pion eers of integrable systems, Hirota Sensei, and this th eocassion of his seventieth birthday.
Training as a physicist in his home university Kyushu University, Professor Hirota earned his PhD in '61 at
Northwestern University with Professor Siegert in the field of "Quantum Statistical mechanics." He wrote a widely
appreciated Doctoral dissertation on "Functional integral representation of the grand partition function.''

Bilinear Integrable Systems: from Classical to Quantum, Continuous to Discrete - Ludwig Padovan - 2007-05-03
On April 29, 1814 Napoleon landed on the island of Elba, surrounded with a personal army of 1200 men. The
allies, Russia, Prussia, England and Austria, had forced him to leave after a number of costly defeats; he was deprived of
all his titles, but could keep the title of "Emperor of Elba." Historiologists that each morning he took long walks in the
review his army each midday and discussed world matters with his appointed advisors, following the same pattern
eyet, to the great surprise of Campbell, the British officer who was to keep an eye on him. All this made
everyone believe he was settled there for good. Napoleonconceded: Elba is beautiful, butabitat. Elbawasnotnately
a source of inspiration; indeed, the early morning, March 6, 1815, Metternich, the chancellor of Austria was
woken up by one of his aides with the stunning news that Napoleon had left Elba with his 1200 men and was
marching to Paris with little resistance; A few days later he took up his throne again in the Tuileries. In spite of
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Nonlinear Physics - Mark J. Ablowitz - 2003
Pt. 1. Analytical methods. On the IST for discrete nonlinear Schrödinger systems and polarization shift for discrete
vector solutions / M.J. Ablowitz, B. Prinari, A.D. Trubatch -- Soliton solutions of coupled nonlinear Klein-Gordon
equations / T. Alaganean -- Characteristic initial value problems for integrable hyperbolic reductions of the
equations / G.A. Alekseev -- Discrete sine-Gordon equation / M. Boiti [und weitere] -- Integrable and non-
integrable equations with peaks / A. Dasgupta, D.D. Holm, A.N.W. Hone -- Solution of a free boundary problem
for a nonlinear diffusion-convection equation / S. De Lillo, M.C. Salvadori, G. Sancinoti -- Iterative
construction of solutions for a nonspectral problem in 2 + 1 dimensions / P.G. Estevaz -- Discrete breathers
close to the anticontinuum limit: existence and wave scattering / S. Fokas [und weiter] -- Complex Toda chain -
an integrable universal model for adiabatic N-soliton interactions / V.S. Gerdjikov -- On the reductions and
scattering data for the generalized Zakharov-Shabat systems / G.G. Grahovski -- Bilinear representation for the
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an integrable universal model for adiabatic N-soliton interactions / V.S. Gerdjikov -- On the reductions and
scattering data for the generalized Zakharov-Shabat systems / G.G. Grahovski -- Bilinear representation for the
modified nonlinear Schrödinger equations and their quantum potential deformations / J.H. Lee, O.K. Pashaev
-- Noncommutative Burgers' equations / L. Martina, O.K. Pashaev -- On the quasi-classical [symbol]-dressing method
/ B. Konopelchenko, A. Moro -- New solvable matrix integrals - U(a) case / A. Yu. Orlov -- Integrable hydrodynamic
chains / M.V. Pavlov -- KP-II: new results and open problems / A.K. Pogrebkov -- A workmate for KdV / P.C.
Sabatier -- Space-time lattice for operator Schrödinger equation / A. Spire, V.V. Konotop, L. Vazquez -- On
isosodromy deformations for the ZS-AKNS flows / D. Wu -- pt. II. Symmetry properties, Hamiltonian methods
and group theoretical methods. New symmetry reductions for a lubrication model / M.S. Bruzón [und weitere] --
Quantum solitons for quantum information and quantum computing / R.K. Bullough, M. Wadati -- Solving
renormalization group equations by recursion relations / A. Cafarella, C. Cortanò, M. Guzzi -- A tri-Hamiltonian
route to spectral curves / L. Degiovanni, G. Magnano -- Construction of real forms of complexified Hamiltonian
dynamical systems / V.S. Gerdjikov [und weiter] -- Integrable and super-integrable systems in classical
mechanics / M. Giordano [und weiter] -- Non-commuting coordinates in vortex dynamics and in the Hall
effect, related to "exotic" Galilean symmetry / P.A. Horváthy -- Structure of multi-meron knot action / L.S. Isaev,
Lame equations / O.I. Mokhov -- Heudouki-Herzantiquity in QQM, time-reversal and Kramers degeneracy / G.
Scolarić -- On the integrability of supersymmetric equations / P. Tempesta, R.A. Lee, G. Soliani

Nonlinear Physics - Mark J. Ablowitz - 2003
Pt. 1. Analytical methods. On the IST for discrete nonlinear Schrödinger systems and polarization shift for discrete
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SIDE III - Decio Levi - 2000-06-15
This volume contains the proceedings of the third meeting on: "Symmetries and Integrability of Difference Equations" (SIDE III). The collection includes original results not published elsewhere and articles that give a rigorous but concise overview of their subject, and provides a complete description of the state of the art.
Research in the field of difference equations--often referred to more generally as discrete systems--has undergone impressive development in recent years. In this collection the reader finds the most important new developments in a number of areas, including: Lie-type symmetries of differential-difference and difference-difference equations, integrability of fully discrete systems such as cellular automata, the connection between integrable and discrete geometry, the isosodromy approach to discrete spectral problems and related discrete Painlevé equations, difference and q-difference equations and orthogonal polynomials, difference equations and quantum groups, and integrability and chaos in discrete-time dynamical systems. The proceedings will be valuable to mathematicians and theoretical physicists interested in the mathematical aspects and/or in the physical applications of discrete nonlinear dynamics, with special emphasis on the systems that can be integrated by analytic methods or at least admit simple explicit solutions. The research in this volume will also be of interest to engineers working in discrete dynamics as well as to theoretical biologists and economists.

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The Atenaueum - 1893
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Mathematical Physics - 1999
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**Superhydrophobic Surfaces** - Alain Carré - 2009-04-24
Superhydrophobic surfaces (water contact angles higher than 150°) can only be achieved by a combination of hydrophobicity (low surface energy materials) with appropriate surface texture. In nature one can find an array of impressive and elegant examples of superhydrophobic surfaces. For example, on a lotus leaf rain drops bounce off after impact, then entirely roll off the lotus leaf and drag along any dirt particles, without leaving residues. The artificial design of superhydrophobic and self-cleaning surfaces has an extremely active area of fundamental and applied research. This book presents both fundamental and applied aspects of superhydrophobic surfaces. It describes also different strategies for making superhydrophobic surfaces from a large diversity of materials (polymers, metals and other inorganic materials, composites) and processes (lithographic techniques, electrochemical processes, self-assembly processes, colloidal particles, sol-gel processes, nanofilaments, or simple scraping). A bountiful of information is covered in this book which represents cumulative wisdom of many world-renowned researchers in the fascinating and burgeoning area of superhydrophobic surfaces.

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Caloger–Moser– Sutherland Models - Jan F. van Diejen - 2012-12-06
In the 1970s F. Calogero and D. Sutherland discovered that for certain potentials in one-dimensional systems, but for any number of particles, the Schrödinger eigenvalue problem is exactly solvable. Until then, there was only one known nontrivial example of an exactly solvable quantum multi-particle problem. J. Moser subsequently showed that the classical counterparts to these models is also amenable to an exact analytical approach. The last decade has witnessed a true explosion of activities involving Calogero-Moser-Sutherland models, and these now play a role in research areas ranging from theoretical physics (such as soliton theory, quantum field theory, string theory, solvable models of statistical mechanics, condensed matter physics, and quantum chaos) to pure mathematics (such as representation theory, harmonic analysis, theory of special functions, combinatorics of symmetric functions, dynamical systems, random matrix theory, and complex geometry). The aim of this volume is to provide an overview of the many branches into which research on CMS systems has diversified in recent years. The contributions are by leading researchers from various disciplines in whose work CMS systems appear, either as the topic of investigation itself or as a tool for further applications.

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The authors include a brief overview of applications of contact angle measurements in surface science and engineering. They also discuss recent advances and research trends in wetting fundamentals and include measurement techniques and data interpretation of contract angles.

**Contact Angle, Wettability and Adhesion** - K. L. Mittal - 2009-09-30

The topic of wettability (measured in terms of contact angle) is of tremendous interest from both fundamental and applied points of view. Wettability plays an essential role in many industrial processes, so an understanding of factors dictating wettability and how to modulate it is of paramount importance. In the last years there has been an explosive interest in superhydrophobic surfaces (i.e., surfaces with water contact angle of 150° or higher) because of their relevance/importance in many areas ranging from self-cleaning windows to nanofluidics. Also recently there has been heightened activity in the field of electrowetting. Contact Angle, Wettability and Adhesion, Volume 6 is divided into four parts: Part 1: Fundamental Aspects; Part 2: Wettability Control/Modification; Part 3: Superhydrophobic Surfaces; and Part 4: Surface Free Energy and Relevance of Wettability in Adhesion. The topics covered include: a guide to the equilibrium contact angles maze: fundamental aspects of wetting of rough and chemically heterogeneous surfaces: work of adhesion for rock-oil-brine systems; Is the world basic?: wettability control/modification using various approaches; superhydrophobic surfaces and ways to impart superhydrophobicity: adsorption on superhydrophobic surfaces; solid surface energy determination; surface modification of different materials; relevance of wettability and adhesion aspects in a variety of reinforced composites. In essence, this volume reflects the cumulative wisdom of many active and renowned researchers and provides a commentary on contemporary research in the fascinating world of contact angles and wettability. This volume and its predecessors (5 volumes), containing bountiful information, will be of much value to anyone interested/involved in controlling wetting phenomena and their applications.

**Geometric Methods in Physics XXXVII** - Piotr Kielanowski - 2020-10-27

The book consists of articles based on the XXXVII Białowieża Workshop on Geometric Methods in Physics, 2019. The series of Białowieża workshops, attended by a community of experts at the crossroads of mathematics and physics, is a major annual event in the field. The works in this book, based on presentations given at the workshop, are previously unpublished, at the cutting edge of current research, typically grounded in geometry and analysis, with applications to classical and quantum physics. For the past eight years, the Białowieża Workshops have been complemented by a School on Geometry and Physics, comprising series of advanced lectures for graduate students and early-career researchers. The extended abstracts of the five lecture series that were given in the eighth school are included. The unique character of the Workshop-and-School series draws on the venue, a famous historical, cultural and environmental site in the Białowieża forest, a UNESCO World Heritage Centre in the east of Poland: lectures are given in the Nature and Forest Museum and local traditions are interwoven with the scientific activities. The chapter “Toeplitz Extensions in Noncommutative Topology and Mathematical Physics” is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

**Geometric Methods in Physics XXXVIII** - Piotr Kielanowski - 2020-10-27

The book consists of articles based on the XXXVIII Białowieża Workshop on Geometric Methods in Physics, 2019. The series of Białowieża workshops, attended by a community of experts at the crossroads of mathematics and physics, is a major annual event in the field. The works in this book, based on presentations given at the workshop, are previously unpublished, at the cutting edge of current research, typically grounded in geometry and analysis, with applications to classical and quantum physics. For the past eight years, the Białowieża Workshops have been complemented by a School on Geometry and Physics, comprising series of advanced lectures for graduate students and early-career researchers. The extended abstracts of the five lecture series that were given in the eighth school are included. The unique character of the Workshop-and-School series draws on the venue, a famous historical, cultural and environmental site in the Białowieża forest, a UNESCO World Heritage Centre in the east of Poland: lectures are given in the Nature and Forest Museum and local traditions are interwoven with the scientific activities. The chapter “Toeplitz Extensions in Noncommutative Topology and Mathematical Physics” is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

**Surface Wetting** - Kock-Yee Law - 2015-11-18

This book describes wetting fundamentals and reviews the standard protocol for contact angle measurements.
experience, this work has been proofread and republished using a format that seamlessly blends the original microstructure determination in colloidal dispersions, and surfactant–polymer interactions. Interfacial Phenomena. Second Edition reflects the progress scientists have made in understanding the surface chemistry and interfacial dynamics of colloid and surfactant systems. The book also illustrates the growing applicability of these systems in a variety of fields including pharmaceuticals, cosmetics, detergents, paints, agricultural chemicals, and foods.

Biomimetics - Bharat Bhushan - 2016-02-19
This revised, updated and expanded new edition presents an overview of biomimetics and biologically inspired structured surfaces. It deals with various examples of biomimetics which include surfaces with roughness-induced superomniprobability, self-cleaning, anti fouling, and controlled adhesion. The focus in the book is on the Lotus Effect, Salvinia Effect, Rose Pelat Effect, Oleophobic/phobic Surfaces, Shark Skin Effect, and Gecko Adhesion. This new edition also contains new chapters on the butterfly wing effect, bio- and inorganic fouling and structure and Properties of Nacre and structural coloration.

Super natural beings from Slovenian myth and folktales - Monika Kropej - 2012

The Entropy Crisis - Guy Deutscher - 2008
Intends to prove that the "energy crisis" is an entropy crisis. This book uses examples from daily experiences to introduce the concept of entropy. It shows that the entropy increase due to irreversible transformations simultaneously determines the level of fresh energy supplies of our society and the damage that it causes to the environment.

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Soap-Bubbles - Charles Vernon Boys - 2018-10-22
This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Modern Tribology Handbook, Two Volume Set - Bharat Bhushan - 2000-12-28
Recent research has led to a deeper understanding of the nature and consequences of interactions between materials on an atomic scale. The results have resonated throughout the field of tribology. For example, new applications require detailed understanding of the tribological process on macro- and microscales and new knowledge guides the rational

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Green Tribology - Michael Nosonovsky - 2012-01-16
Tribology is the study of friction, wear and lubrication. Recently, the concept of “green tribology” as “the science and technology of the tribological aspects of ecological balance and of environmental and biological impacts” was introduced. The field of green tribology includes tribological technology that mimics living nature (biomimetic surfaces) and thus is expected to be environmentally friendly. The control of friction and wear that is of importance for energy conservation and conversion, environmental aspects of lubrication and surface modification techniques, and tribological aspects of green applications such as wind-power turbines or solar panels. This book is the first comprehensive volume on green tribology. The chapters are prepared by leading experts in their fields and cover such topics as biomimetics, environmentally friendly lubrication, tribology of wind turbines and renewable sources of energy, and ecological impact of new technologies of surface treatment.

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Pipeline and Energy Plant Piping - Welding Institute of Canada - 1980

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Spectroscopy of Emerging Materials - Eric C. Faulques - 2005
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Nonlinear Targeted Energy Transfer in Mechanical and Structural Systems - Alexander F. Vakakis - 2008-12-24
This monograph evolved over a period of nine years from a series of papers and presentations addressing the subject of passive vibration control of mechanical systems subjected to broadband, transient inputs. The unifying theme is Targeted Energy Transfer – TET, which represents a new and unique approach to the passive control problem, in which a strongly nonlinear, fully passive, local attachment, the Nonlinear Energy Sink - NES, is employed to drastically alter the dynamics of the primary system to which it is attached. The intrinsic capacity of the properly - signed NES to promote rapid localization of externally applied (narrowband) - bration or broadband) shock energy to itself, where it can be captured and dissipated, provides a powerful strategy for vibration control and the opens the pos- bility for a wide range of applications of TET, such as, vibration and shock
Droplet behavior and surface wettability. The contents in this book, which are all research hotspots currently, control, enhanced reliability designs (for example in power grids) and others. The monograph is intended to provide a thorough explanation of the analytical, computational and experimental methods needed to formulate and study TET in mechanical and structural systems. Several prac-cal engineering applications are examined in detail, and experimental verification and validation of the theoretical predictions are provided as well. The authors also suggest a number of possible future applications where application of TET seems promising. The authors are indebted to a number of sponsoring agencies.

**Nonlinear Targeted Energy Transfer in Mechanical and Structural Systems** - Alexander F. Vakakis - 2008-12-24

This monograph evolved over a period of nine years from a series of papers and presentations addressing the subject of passive vibration control of mechanical s-tens subjected to broadband, transient inputs. The unifying theme is Targeted -ergy Transfer - TET, which represents a new and unique approach to the passive control problem, in which a strongly nonlinear, fully passive, local attachment, the Nonlinear Energy Sink - NES, is employed to drastically alter the dynamics of the primary system to which it is attached. The intrinsic capacity of the properly - signed NES to promote rapid localization of externally applied (narrowband) - bration or (broadband) shock energy to itself, where it can be captured and dis-pated, provides a powerful strategy for vibration control and the opens the pos-sibility for a wide range of applications of TET, such as, vibration and shock isolation, passive energy harvesting, aerodynamic instability (flutter) suppression, se-mic mitigation, vortex shedding control, enhanced reliability designs (for ex-ple in power grids) and others. The monograph is intended to provide a thorough explanation of the analytical, computational and experimental methods needed to formulate and study TET in mechanical and structural systems. Several prac-cal engineering applications are examined in detail, and experimental verification and validation of the theoretical predictions are provided as well. The authors also suggest a number of possible future applications where application of TET seems promising. The authors are indebted to a number of sponsoring agencies.

**Semiconducting Polymers** - Georges Hadziioannou - 2006-12-15

The field of semiconducting polymers has attracted many researchers from a diversity of disciplines. Printed circuitry, flexible electronics and displays are already migrating from laboratory successes to commercial applications, but even now fundamental knowledge is deficient concerning some of the basic phenomena that so markedly influence a device's usefulness and competitiveness. This two-volume handbook describes the various approaches to doped and undoped semiconducting polymers taken with the aim to provide vital understanding of how to control the properties of these fascinating organic materials. Prominent researchers from the fields of synthetic chemistry, physical chemistry, engineering, computational chemistry, theoretical physics, and applied physics cover all aspects from compounds to devices. Since the first edition was published in 2000, significant findings and successes have been achieved in the field, and especially handheld electronic gadgets have become billion-dollar markets that promise a fertile application ground for flexible, lighter and disposable alternatives to classic silicon circuitry. The second edition brings readers up-to-date on cutting edge research in this field.

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**Condensed and Melting Droplet Behavior on Superhydrophobic Surfaces** - Fuqiang Chu - 2020-10-30

This book introduces the fabrication of superhydrophobic surfaces and some unique droplet behaviors during condensation and melting phase change on superhydrophobic surfaces, and discusses the relationship between shall not only bring new insights into the physics of condensation and icing/frosting phenomena, but also provide theoretical support to solve the heat transfer deterioration, the ice/frost accretion and other related engineering problems. This book is for the majority of graduate students and researchers in related scientific areas.

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**Analytic-Bilinear Approach to Integrable Hierarchies** - L.V. Bogdanov - 2012-12-06

The subject of this book is the hierarchies of integrable equations connected with the one-component and multi component loop groups. There are many publications on this subject, and it is rather well defined. Thus, the author would like to explain why he has taken the risk of revisiting the subject. The Sato Grassmannian approach, and other approaches standard in this context, reveal deep mathematical structures in the base of the integrable hierarchies. These approaches concentrate mostly on the algebraic picture, and they use a language suitable for applications to quantum field theory. Another well-known approach, the a-dressing method, developed by S. V. Manakov and V.E. Zakharov, is oriented mostly to particular systems and exact classes of their solutions. There is more emphasis on analytic properties, and the technique is connected with standard complex analysis. The language of the a-dressing method is suitable for applications to integrable nonlinear PDEs, integrable nonlinear discrete equations, and, as recently discovered, for the applications of integrable systems to continuous and discrete geometry. The primary motivation of the author was to formalize the approach to the integrable hierarchies that was developed in the context of the a-dressing method, preserving the analytic structures characteristic for this method, but omitting the peculiarieties of the constructive scheme. And it was desirable to find a start.

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**Droplet Wetting and Evaporation** - David Brzin - 2015-05-11

Droplet Wetting and Evaporation provides engineers, students, and researchers with the first comprehensive guide to the theory and applications of droplet wetting and evaporation. Beginning with a relevant theoretical background, the book moves on to consider specific aspects, including heat transfer, flow instabilities, and the drying of complex fluid droplets. Each chapter covers the principles of the subject, addressing corresponding practical issues and problems. The text is ideal for a broad range of domains, from aerospace and materials, to biomedical applications, comprehensively relating the challenges and approaches from the different communities leading the way in droplet research and development. Provides a broad, cross-subject coverage of theory and
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**Nanodroplets** - Zhiming M. Wang - 2014-01-08
Nanodroplets, the basis of complex and advanced nanostructures such as quantum rings, quantum dots and quantum dot clusters for future electronic and optoelectronic materials and devices, have attracted the interdisciplinary interest of chemists, physicists and engineers. This book combines experimental and theoretical analyses of nanodized droplets which reveal many attractive properties. Coverage includes nanodroplet synthesis, structure, unique behaviors and their nanofabrication, including chapters on focused ion beam, atomic force microscopy, molecular beam epitaxy and the “vapor-liquid-solid” route. Particular emphasis is given to the behavior of metallic nanodroplets, water nanodroplets and nanodroplets in polymer and metamaterial nanocomposites. The contributions of leading scientists and their research groups will provide readers with deeper insight into the chemical and physical mechanisms, properties, and potential applications of various nanodroplets.

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**Packaging Technology and Engineering** - Dipak K. Sarker - 2020
"Use of packaging is often thought of as an industrial age concept but this is entirely untrue. In more ancient times products of economic or nutritional value were always wrapped in a suitable material to convey the need to protect the contents. The Roman emperors and Byzantine kings frequently wrapped precious good in all manner of materials from woven rattan baskets to carved and gilded in-laid ebony boxes. Expensive luxury goods such as chalices, and ceremonial goods are almost always stored in a suitable presentation case that demonstrated the value of the product contained within. Perfumes, chrism oils and ceremonial jewellery has always been contained in sculpted ivory, antler horn and carved lidded boxes and glazed pottery. The use of bespoke packaging is really a modern age phenomenon. However, the footsteps of packaging use began with leaves and birch bark and other natural materials. In antiquity and prehistoric times humans wrapped their foods in crudely fashioned carriers and containers but also pelts and hides. Mass production of containers later involved woven materials e.g. rushes and reeds to create baskets and carriers but also the use of, textiles, pottery and bronze amphora and carved objects e.g. ivory, antler horn and wood. Recent estimates place "crude glass" or vitrified materials and wood packaging use to at least 3000 BC and these artifacts come from the Indus Valley civilisations and Mesopotamia--

**Biotechnologies and Biomimetics for Civil Engineering** - Fernando Pacheco Torgal - 2014-08-16
Putting forward an innovative approach to solving current technological problems faced by human society, this book encompasses a holistic way of perceiving the potential of natural systems. Nature has developed several materials and processes which both maintain an optimal performance and are also totally biodegradable, putting forward an innovative approach to solving current technological problems faced by human society. Nature has developed several materials and processes which both maintain an optimal performance and are also totally biodegradable.
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