

PHYSICS REVIEWS

Editor: I. M. Khalatnikov, L. D. Landau Institute for Theoretical Physics, Moscow, Russia

LANDAU-POMERANCHUK-MIGDAL EFFECT

A. I. Akhiezer, M. F. Shul'ga and S. P. Fomin, Kharkov Institute of Physics and Technology, Ukraine

This review considers various aspects of the theory of radiation of relativistic particles which is of interest to theorists and to experimental physicists. The authors introduce the problem of electron radiation in a given field of a separate atom and then study the influence of multiple scattering of a particle on the radiation. The authors also introduce the Landau-Pomeranchuk effect (1953) consisting of the reduction of probability of radiation of the relativistic electron in an amorphous medium and consider in detail the contribution of the fundamental work by Migdal in 1954 and 1956. These methods have been developed significantly and the review describes the current applications.

2005 218pp Pbk 1-904868-37-1 £38.50/\$60.00

MAGNETIC & MAGNETOELASTIC PROPERTIES OF ANTIFERROMAGNETS AND SUPERCONDUCTORS

V. V. Ereminenko and V. A. Strenko, Institute for Low Temperature Physics, Kharkov, Ukraine

Magnetic and magnetoelastic properties of antiferromagnets and superconductors in the vicinity of phase transitions induced by a magnetic field are considered. At these conditions inhomogeneous states appear in antiferromagnets, similar to either intermediate state type I superconductors or the mixed one in type II superconductors. The authors discuss the measurements for simple representatives of antiferromagnets and superconductors such as the transition metal based uni-axial two-sublattice antiferromagnetic insulator and superconducting dichalcogenides $2H-NiSe_2$, which revealed quantum oscillations of magnetoresistance and its peculiarities in a peak effect regime. This book is intended for postgraduates and researchers in magnetic properties of strongly correlated electronic systems and for students of applied physics.

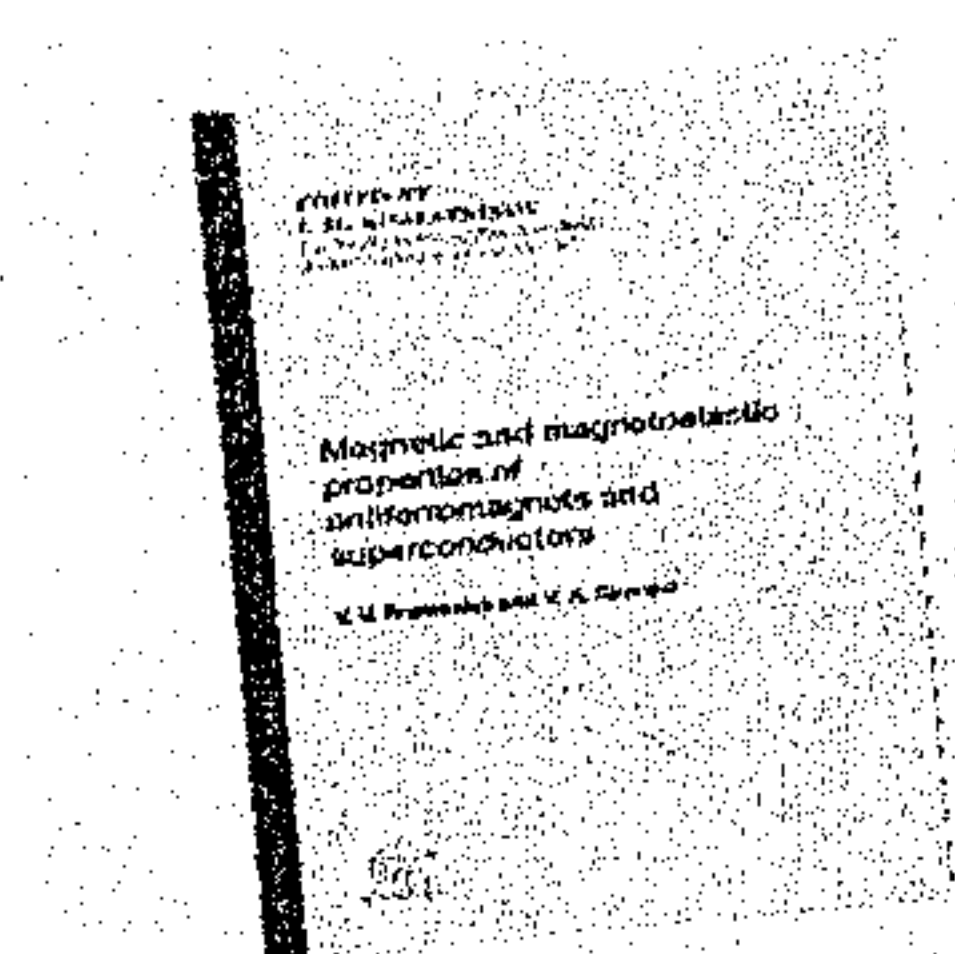
2009 312pp Pbk 978-1-904868-54-5 £38.50/\$60.00

POLARIZATION AND INTERFERENCE EFFECTS IN RADIATION PROCESSES

V. A. Astapenko, Moscow Institute for Physics and Technology

This review presents results of recent investigations concerning the polarization and interference effects that arise in radiation processes such as bremsstrahlung on targets with electron core, photo-effect in bidirectional electromagnetic field, femtosecond photon echo in nanocrystals and associated phenomena.

2006 200pp Pbk 1-904868-50-9 £38.50/\$60.00



COLLISION PROCESSES INVOLVING HIGHLY EXCITED ATOMS AND NEUTRAL PARTICLES

V. S. Lebedev, P.N. Lebedev Institute, Moscow, Russia

This volume presents a current review of knowledge on elementary collision processes of highly excited atoms, with neutral particles. It provides the basic physical approaches and theoretical techniques for the description of a broad class of observed collision phenomena in gas and low temperature plasmas involving Rydberg atoms.

2004 304pp Pbk 1-904868-34-7 £45.00/\$70.00

KINETIC PHENOMENA IN METALLIC MULTILAYERS

L. V. Dokhtyruk, Kharkov State University, Yu. A. Kolesnichenko and V.G. Peschansky, Institute for Low Temperature, Kharkov, Ukraine

This review describes a series of kinetic phenomena in metallic multilayers. The kinetic properties of multilayers differ from the properties of both massive metals and thin films.

2004 113pp Pbk 1-904868-36-3 £27.50/\$45.00

ATOM VIBRATIONS IN SOLIDS: AMPLITUDES AND FREQUENCIES

V. V. Levitin, Zaporozhye State Technical University, Ukraine

Many properties of solids are related to crystal lattice oscillations and this phenomenon is of theoretical and practical significance. This review describes experimental investigations of heat atom vibrations and associated data including specific measurements of the mean-square atom displacements.

2004 162pp Pbk 1-904868-35-5 £33.50/\$48.00

THE INVERSE SCATTERING PROBLEM AND INSTANTON CONSTRUCTION BY ALGEBRAIC GEOMETRY

A.A. Belavin, L.D. Landau Institute for Theoretical Physics, Moscow

This classic paper was first published in Soviet Scientific Reviews in 1979; Professor A.A. Belavin is one of the originators of instanton theory and the paper provides a clear summary of an important subject with some significant insights. More than thirty years later, instantons continue to be of interest and the timely republication of this classic paper provides an accessible reference text for students and researchers. Recently, L.F. Adik, D. Gaiotto and Y. Tachikawa proposed the striking relation between 2-conformal field theory and $N=2$ SUSY $d=4$ QCD confirms the current increasing interest in instantons and highlights the importance and contribution of the fundamental work.

2011 80pp Pbk 978-1-908106-11-7 £22.50/\$35.00

TITLES IN MATHEMATICS AND PHYSICS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON TOPOLOGY AND ITS APPLICATIONS (ICTA 2011)

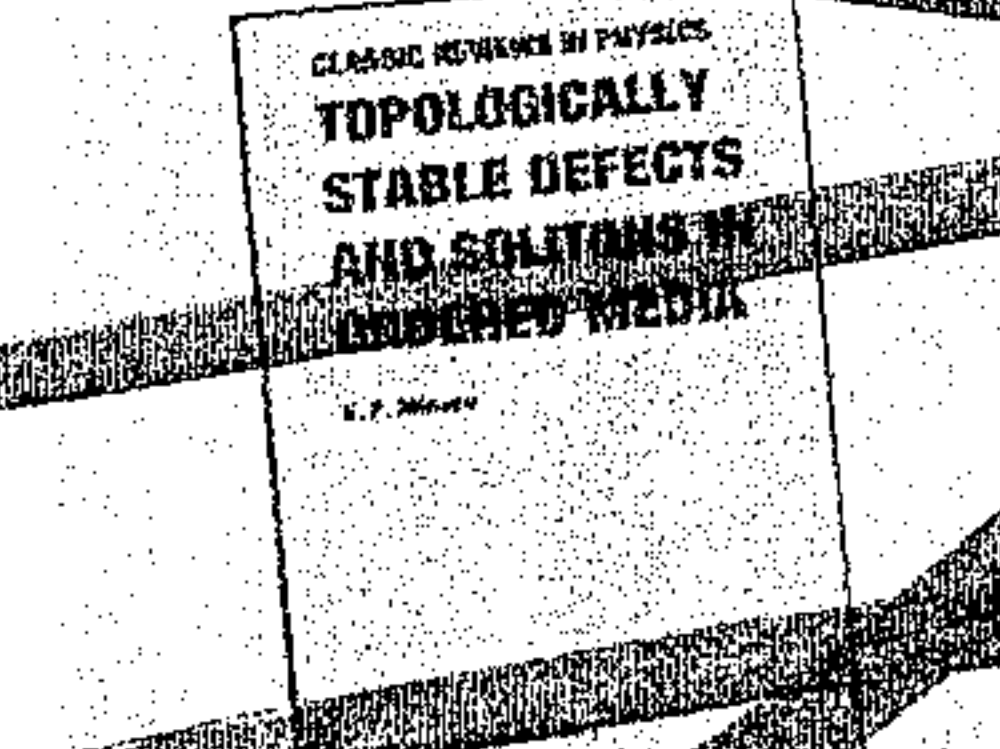
Alexander V. Arhangelskii, Mainz ud Din Khan, Ljubisa D.R. Kočinac (eds)

ICTA 2011 was held in July 2011 in Islamabad, Pakistan. The aim of the conference was to review and explore some of the recent achievements in topology and to provide an opportunity for scientific exchange and interaction between scientists who work on different aspects and applications of topology. Topics include: Set Theory and Set-Theoretic Topology; General Topology; Algebraic Topology; Geometric Topology; Symplectic Topology; Continuum Theory; Asymmetric Topology; Symmetric Topology; Categorical, Point-free or Constructive Aspects of Topology; Topology on Lattices; History of Topology; Generalized Topology; Applications of Topology. This volume will provide a useful reference for graduates and researchers working in this area of mathematics.

2012 250pp Pbk 978-1-908106-19-3 £60.00/\$93.00

CLASSIC REVIEWS IN PHYSICS

Edited by I.M. Khalatnikov, L. D. Landau Institute for Theoretical Physics, Moscow, Russia



TOPOLOGICALLY STABLE DEFECTS AND SOLITONS IN ORDERED MEDIA

V. P. Mineev, CEA, Grenoble, France

This classic paper describes topologically stable patterns such as vortices, disclinations, dislocations and domain walls in ordered media (superfluids, liquid and solid crystals, magnets). It also introduces the basic notions of homotopic group theory and the necessary algebraic topology constructions. The author is one of the inventors of topological classification of defects in a theory of ordered media.

Classic Reviews in Physics
1998 80pp Hbk 90 5702 272 9 £22.50/\$35.00

A LIFETIME IN MAGNETISM AND SUPERCONDUCTIVITY: A TRIBUTE TO PROFESSOR DAVID BERNSTEIN

Edited by G. Anastassiou, S.S. Saxena, University of Cambridge, V. V. Ereminenko, V. V. Ereminenko, Institute for Low Temperature Physics, Kharkov, Ukraine

This multi-author volume in honour of Professor David Bernstein, University of Cambridge reviews his publications, achievements and outstanding contribution to low temperature physics, and provides a useful source of reference for postgraduate students and researchers. Contents include:

Novel metallic states at low temperatures

AKumar, S. S. Saxena, M. Marciano, M. P. M. de Oliveira, C. T. O'Farrell, D. J. W. Simons, and G. G. Lonzarich, C. K. Kao, C. L. Chien, S. Saxena

David Bernstein and the beam

David Bernstein and M. P. M. de Oliveira

De Haas-van Alphen effect in 2D systems

Applications to mono- and bilayer graphene

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Diamagnetism of layered organic materials

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N.V. Khodkevich, Yu.A. Kolesnichenko and J.K. Ruckenstein

Anomalous resistivity and superconductivity in the two-band Hubbard model with one narrow band

Yu. V. Kagan and V.V. Arkov

Magnetic and superconducting properties of $FeSe-xTe$

A.V. Fedorchenko, G.E. Grednev, V. V. Ereminenko, A.S. Panikov, S.L. Ginzhenko, V.V. Tsurkan, J. B. Eisenhofer, H.A. Krug von Nidda, A. Loidl, D.A. Chareev, O. V. Kovaleva and A.N. Vasilev

Micro-wave-induced magnetoo oscillations and absolute negative conductivity in the subband two-dimensional electron system on liquid helium

Yu. P. Monarkha

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APPROXIMATION BY SINGULAR INTEGRALS

G. Anastassiou and R. Mezei, University of Memphis, USA

This monograph is the first one to deal exclusively with the study of the approximation of singular integrals to the identity-unit operator. The authors study quantitatively the basic approximation properties of the general Picard, Gauss-Weierstrass and Poisson-Cauchy singular integral operators over the real line, which are not positive linear operators. In particular the authors study the rate of convergence of these operators to the unit operator, as well as the related simultaneous approximation and the global smoothness preservation property of these operators. The corresponding general approximation theory of general singular integral operators is presented with many applications to the trigonometric singular integral. For the convenience of the reader, the chapters of this book are written in a self-contained style. This monograph is intended for researchers, graduate students working in many areas of pure and applied mathematics, including mathematical analysis, probability, statistics, ordinary and partial differential equations.

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TOPICS IN COMPLEX APPROXIMATION

G. Anastassiou, University of Memphis, USA

In this monograph we study quantitatively the order of simultaneous approximation and Voronovskaja type asymptotic results for complex Bernstein-Schurer, Kantorovich-Schurer and Bernstein-Durrmeyer polynomials related to analytic functions on compact disks. In this way the overconvergence phenomenon for Bernstein-Schurer and Bernstein-Durrmeyer polynomials is revealed. We continue with explicit quantitative estimates for the overconvergence in the complex plane of the partial sums of the Fourier-type expansions on $[-1, 1]$ with respect to Chebyshev and Legendre orthogonal polynomials. Furthermore we obtain quantitative estimates in the overconvergence phenomenon for the classical and generalized singular integrals of Gauss-Weierstrass, Poisson-Cauchy and Picard on a strip. Furthermore we present Jackson type approximation results by generalizations of multi-complex Picard, Poisson-Cauchy and Gauss-Weierstrass singular integrals in terms of higher order moduli of smoothness on polydisks. It follows quantitative estimates in the overconvergence phenomenon on polydisks, for the weighted and non-weighted cases, for generalized multicomplex singular integrals of Picard, Poisson-Cauchy and Gauss-Weierstrass types. We establish basic results concerning the best approximation of vector-valued functions by generalized polynomials. The overconvergence of singular integrals is presented for the first time in book form. This monograph is intended for researchers, graduate students working in many areas of pure and applied mathematics.

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Anastassiou, George A., Duman, Oktay

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The research findings will be useful in various applications including applied and computational mathematics, stochastics, engineering, artificial intelligence, vision and machine learning. This monograph is directed to graduate students, researchers, practitioners and professors of all disciplines.

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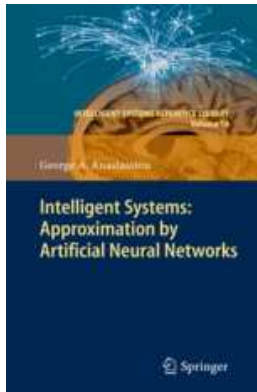
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Anastassiou, George A.

1st Edition., 2011, VIII, 108 p.

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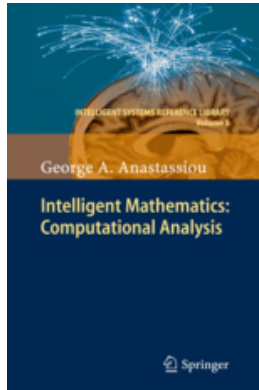
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expected to find applications to: applied and computational mathematics, stochastics, engineering, artificial intelligence, vision, complexity and machine learning. This monograph is suitable for graduate students and researchers.

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