

Ludwig Pittner

Algebraic Foundations of Non-Commutative Differential Geometry and Quantum Groups

Algebraic Foundations Of Noncommutative Differential Geometry And Quantum Groups

**Michiel Hazewinkel, Nadezhda
Mikhaïlovna Gubareni, Vladimir V.
Kirichenko**



Algebraic Foundations Of Noncommutative Differential Geometry And Quantum Groups:

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Quantum Groups and Their Representations Anatoli Klimyk, Konrad Schmüdgen, 2012-12-06 This book start with an introduction to quantum groups for the beginner and continues as a textbook for graduate students in physics and in mathematics It can also be used as a reference by more advanced readers The authors cover a large but well chosen variety of subjects from the theory of quantum groups quantized universal enveloping algebras quantized algebras of functions and q deformed algebras q oscillator algebras their representations and corepresentations and noncommutative differential calculus The book is written with potential applications in physics and mathematics in mind The basic quantum groups and quantum algebras and their representations are given in detail and accompanied by explicit formulas A number of topics and results from the more advanced general theory are developed and discussed

An Introduction to Noncommutative Differential Geometry and Its Physical Applications J. Madore, 1999-06-24 A thoroughly revised introduction to non commutative geometry

Classical and Quantum Nonlocality Peter G. Bergmann, V. De Sabbata, J. N. Goldberg, 2000 This book provides an up to date understanding of the progress and current problems of the interplay of nonlocality in the classical theories of gravitation and quantum theory These problems lie on the border between general relativity and quantum physics including quantum gravity

Classical And Quantum Nonlocality: Proceedings Of The 16th Course Of The International School Of Cosmology And Gravitation P G Bergmann, Venzo De Sabbata, Joshua N Goldberg, 2000-08-21 This book provides an up to date understanding of the progress and current problems of the interplay of nonlocality in the classical theories of gravitation and quantum theory These problems lie on the border between general relativity and quantum physics including quantum

gravity *Quantum Groups and Lie Theory* Andrew Pressley, 2002-01-17 Since its genesis in the early 1980s the subject of quantum groups has grown rapidly By the late 1990s most of the foundational issues had been resolved and many of the outstanding problems clearly formulated To take stock and to discuss the most fruitful directions for future research many of the world's leading figures in this area met at the Durham Symposium on Quantum Groups in the summer of 1999 and this volume provides an excellent overview of the material presented there It includes important surveys of both cyclotomic Hecke algebras and the dynamical Yang Baxter equation Plus contributions which treat the construction and classification of quantum groups or the associated solutions of the quantum Yang Baxter equation The representation theory of quantum groups is discussed as is the function algebra approach to quantum groups and there is a new look at the origins of quantum groups in the theory of integrable systems *Recent Advances in Noncommutative Algebra and Geometry* K. A. Brown, T. J. Hodges, M. Vancliff, J. J. Zhang, 2024-05-30 This volume contains the proceedings of the conference Recent Advances and New Directions in the Interplay of Noncommutative Algebra and Geometry held from June 20-24, 2022 at the University of Washington Seattle in honor of S. Paul Smith's 65th birthday The articles reflect the wide interests of Smith and provide researchers and graduate students with an indispensable overview of topics of current interest Specific fields covered include noncommutative algebraic geometry representation theory Hopf algebras and quantum groups the elliptic algebras of Feigin and Odesskii Calabi-Yau algebras Artin-Schelter regular algebras deformation theory and Lie theory In addition to original research contributions the volume includes an introductory essay reviewing Smith's research contributions in these fields and several survey articles **Algebras, Rings and Modules** Michiel Hazewinkel, Nadezhda Mikhailovna Gubarenko, Vladimir V. Kirichenko, 2010 The main goal of this book is to present an introduction to and applications of the theory of Hopf algebras The authors also discuss some important aspects of the theory of Lie algebras The first chapter can be viewed as a primer on Lie algebras with the main goal to explain and prove the Gabriel-Bernstein-Gelfand-Ponomarev theorem on the correspondence between the representations of Lie algebras and quivers this material has not previously appeared in book form The next two chapters are also primers on coalgebras and Hopf algebras respectively they aim specifically to give sufficient background on these topics for use in the main part of the book Chapters 4-7 are devoted to four of the most beautiful Hopf algebras currently known the Hopf algebra of symmetric functions the Hopf algebra of representations of the symmetric groups although these two are isomorphic they are very different in the aspects they bring to the forefront the Hopf algebras of the nonsymmetric and quasisymmetric functions these two are dual and both generalize the previous two and the Hopf algebra of permutations The last chapter is a survey of applications of Hopf algebras in many varied parts of mathematics and physics Unique features of the book include a new way to introduce Hopf algebras and coalgebras an extensive discussion of the many universal properties of the functor of the Witt vectors a thorough discussion of duality aspects of all the Hopf algebras mentioned emphasis on the combinatorial aspects of Hopf algebras and a survey of

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Quantum Riemannian Geometry Edwin J. Beggs, Shahn Majid, 2020-01-31 This book provides a comprehensive account of a modern generalisation of differential geometry in which coordinates need not commute This requires a reinvention of differential geometry that refers only to the coordinate algebra now possibly noncommutative rather than to actual points Such a theory is needed for the geometry of Hopf algebras or quantum groups which provide key examples as well as in physics to model quantum gravity effects in the form of quantum spacetime The mathematical formalism can be applied to any algebra and includes graph geometry and a Lie theory of finite groups Even the algebra of 2×2 matrices turns out to admit a rich moduli of quantum Riemannian geometries The approach taken is a bottom up one in which the different layers of geometry are built up in succession starting from differential forms and proceeding up to the notion of a quantum Levi Civita bimodule connection geometric Laplacians and in some cases Dirac operators The book also covers elements of Connes approach to the subject coming from cyclic cohomology and spectral triples Other topics include various other cohomology theories holomorphic structures and noncommutative D modules A unique feature of the book is its constructive approach and its wealth of examples drawn from a large body of literature in mathematical physics now put on a firm algebraic footing Including exercises with solutions it can be used as a textbook for advanced courses as well as a reference for researchers

GROUP 24 J.P Gazeau, R Kerner, J.P Antoine, S Metens, J.Y Thibon, 2003-11-30 One of the most enduring elements in theoretical physics has been group theory GROUP 24 Physical and Mathematical Aspects of Symmetries provides an important selection of informative articles describing recent advances in the field The applications of

group theory presented in this book deal not only with the traditional fields of physics but also include such disciplines as chemistry and biology Awarded the Wigner Medal and the Weyl Prize respectively H J Lipkin and E Frenkel begin the volume with their contributions Plenary session contributions are represented by 18 longer articles followed by nearly 200 shorter articles The book also presents coherent states wavelets and applications and quantum group theory and integrable systems in two separate sections As a record of an international meeting devoted to the physical and mathematical aspects of group theory GROUP 24 Physical and Mathematical Aspects of Symmetries constitutes an essential reference for all researchers interested in various current developments related to the important concept of symmetry **Recent Advances in**

Algebraic Geometry Christopher D. Hacon, Mircea Mustață, Mihnea Popa, 2015-01-15 A comprehensive collection of expository articles on cutting edge topics at the forefront of research in algebraic geometry **Singularities and**

Computer Algebra Christoph Lossen, Gerhard Pfister, 2006-04-06 A collection of articles giving overviews and open questions in singularities and their computational aspects **Number Theory and Algebraic Geometry** Miles Reid, Alexei Skorobogatov, 2003 Sir Peter Swinnerton Dyer's mathematical career encompasses more than 60 years work of amazing creativity This volume provides contemporary insight into several subjects in which Sir Peter's influence has been notable and is dedicated to his 75th birthday The opening section reviews some of his many remarkable contributions to mathematics and other fields The remaining contributions come from leading researchers in analytic and arithmetic number theory and algebraic geometry The topics treated include rational points on algebraic varieties the Hasse principle Shafarevich Tate groups of elliptic curves and motives Zagier's conjectures descent and zero cycles Diophantine approximation and Abelian and Fano varieties **The Navier-Stokes Equations** P. G. Drazin, N. Riley, 2006-05-25 This 2006 book details exact solutions to the Navier Stokes equations for senior undergraduates and graduates or research reference **Groups St Andrews 2009**

in Bath: Volume 1 C. M. Campbell, M. R. Quick, E. F. Robertson, C. M. Roney-Dougal, G. C. Smith, G. Traustason, 2011-06-16 Groups St Andrews 2009 was held in the University of Bath in August 2009 and this first volume of a two volume book contains selected papers from the international conference Five main lecture courses were given at the conference and articles based on their lectures form a substantial part of the proceedings This volume contains the contributions by Gerhard Hiss RWTH Aachen and Volodymyr Nekrashevych Texas A M Apart from the main speakers refereed survey and research articles were contributed by other conference participants Arranged in alphabetical order these articles cover a wide spectrum of modern group theory The regular proceedings of Groups St Andrews conferences have provided snapshots of the state of research in group theory throughout the past 30 years Earlier volumes have had a major impact on the development of group theory and it is anticipated that this volume will be equally important **Complex Analysis** Serge Lang, 2013-03-14 The present book is meant as a text for a course on complex analysis at the advanced undergraduate level or first year graduate level The first half more or less can be used for a one semester course addressed to undergraduates

The second half can be used for a second semester at either level. Somewhat more material has been included than can be covered at leisure in one or two terms to give opportunities for the instructor to exercise individual taste and to lead the course in whatever directions strikes the instructor's fancy at the time as well as extra reading material for students on their own. A large number of routine exercises are included for the more standard portions and a few harder exercises of striking theoretical interest are also included but may be omitted in courses addressed to less advanced students. In some sense I think the classical German prewar texts were the best: Hurwitz, Courant, Knopp, Bieberbach etc. and I would recommend to anyone to look through them. More recent texts have emphasized connections with real analysis which is important but at the cost of exhibiting succinctly and clearly what is peculiar about complex analysis: the power series expansion, the uniqueness of analytic continuation and the calculus of residues.

Introduction to Elliptic Curves and Modular Forms Neal I. Koblitz, 2012-12-06. This textbook covers the basic properties of elliptic curves and modular forms with emphasis on certain connections with number theory. The ancient congruent number problem is the central motivating example for most of the book. My purpose is to make the subject accessible to those who find it hard to read more advanced or more algebraically oriented treatments. At the same time I want to introduce topics which are at the forefront of current research. Down to earth examples are given in the text and exercises with the aim of making the material readable and interesting to mathematicians in fields far removed from the subject of the book. With numerous exercises and answers included the textbook is also intended for graduate students who have completed the standard first year courses in real and complex analysis and algebra. Such students would learn applications of techniques from those courses thereby solidifying their understanding of some basic tools used throughout mathematics. Graduate students wanting to work in number theory or algebraic geometry would get a motivational example oriented introduction. In addition advanced undergraduates could use the book for independent study projects, senior theses and seminar work.

Localization in Periodic Potentials Dmitry E. Pelinovsky, 2011-10-06. This book provides a comprehensive treatment of the Gross-Pitaevskii equation with a periodic potential, in particular the localized modes supported by the periodic potential. It takes the mean field model of the Bose-Einstein condensation as the starting point of analysis and addresses the existence and stability of localized modes. The mean field model is simplified further to the coupled nonlinear Schrödinger equations, the nonlinear Dirac equations and the discrete nonlinear Schrödinger equations. One of the important features of such systems is the existence of band gaps in the wave transmission spectra which support stationary localized modes known as the gap solitons. These localized modes realise a balance between periodicity, dispersion and nonlinearity of the physical system. Written for researchers in applied mathematics, this book mainly focuses on the mathematical properties of the Gross-Pitaevskii equation. It also serves as a reference for theoretical physicists interested in localization in periodic potentials.

Motivic Integration and its Interactions with Model Theory and Non-Archimedean Geometry: Volume 1 Raf Cluckers, Johannes Nicaise, Julien Sebag, 2011-09-22. The development of Maxim Kontsevich's initial

ideas on motivic integration has unexpectedly influenced many other areas of mathematics ranging from the Langlands program over harmonic analysis to non Archimedean analysis singularity theory and birational geometry This book assembles the different theories of motivic integration and their applications for the first time allowing readers to compare different approaches and assess their individual strengths All of the necessary background is provided to make the book accessible to graduate students and researchers from algebraic geometry model theory and number theory Applications in several areas are included so that readers can see motivic integration at work in other domains In a rapidly evolving area of research this book will prove invaluable This first volume contains introductory texts on the model theory of valued fields different approaches to non Archimedean geometry and motivic integration on algebraic varieties and non Archimedean spaces

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In a world eaten by screens and the ceaseless chatter of quick communication, the melodic splendor and emotional symphony produced by the published term frequently disappear in to the background, eclipsed by the constant noise and interruptions that permeate our lives. Nevertheless, set within the pages of **Algebraic Foundations Of Noncommutative Differential Geometry And Quantum Groups** an enchanting literary prize filled with raw emotions, lies an immersive symphony waiting to be embraced. Crafted by a wonderful composer of language, this interesting masterpiece conducts visitors on a mental trip, well unraveling the hidden tunes and profound influence resonating within each carefully crafted phrase. Within the depths of the poignant review, we can explore the book's main harmonies, analyze its enthralling writing style, and surrender ourselves to the profound resonance that echoes in the depths of readers' souls.

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