Deformation Theory

Deformation Theory of Algebras and Structures and Applications
Deformation Theory and Quantum Groups with Applications to Mathematical Physics
The Isomonodromic Deformation Method in the Theory of Painleve Equations
Proceedings of a AMS-IMS-SIAM 1990 Joint Summer Research Conference Held June 14-20 at the University of Massachusetts, Amherst, with Support from the National Science Foundation
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Deformation Theory of Algebraic and Geometric Structures
Deformation and Progressive Failure in Geomechanics
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Complex Manifolds and Deformation of Complex Structures
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Deformation Theory of Algebras and Structures and Applications
Deformation Theory of Complex Manifolds

MORENO JAX

Deformation Theory of Algebras and Structures and Applications Springer High-technology industries using plastic deformation demand soundly-based economical decisions in manufacturing design and product testing, and the unified constitutive laws of plastic deformation give researchers aguideline to use in making these decisions. This book provides extensive guidance in low cost manufacturing without the loss of product quality. Each highly detailed chapter of Unified Constitutive Laws of Plastic Deformation focuses on a distinct set of defining equations. Topics covered include anisotropic and viscoplastic flow, and the overall kinetics and thermodynamics of deformation. This important book deals with a prime topic in materials science and engineering, and will be of great use toboth researchers and graduate students. Describes the theory and applications of the constitutive law of plastic deformation for materials testing Examines the constitutive law of plastic deformation as it applies to process and product design Includes a program on

disk for the determination and development of the constitutive law of plastic deformation Considers economical design and testing methods

Deformation Theory and Quantum Groups with Applications to Mathematical Physics Springer Science & Business Media

The deformation theory of automorphic representations is used to study local properties of Galois representations associated to automorphic representations of general linear groups and symplectic groups. In some cases this allows to identify the local Galois representations with representations predicted by a local Langlands correspondence.

The Isomonodromic Deformation Method in the Theory of Painleve Equations American Mathematical Society

Kodaira is a Fields Medal Prize Winner. (In the absence of a Nobel prize in mathematics, they are regarded as the highest professional honour a mathematician can attain.) Kodaira is an honorary member of the London Mathematical Society. Affordable softcover edition of 1986 classic

Proceedings of a AMS-IMS-SIAM 1990 Joint Summer Research Conference Held June 14-20 at the University of Massachusetts, Amherst, with Support from the National Science Foundation American Mathematical Soc.

These lectures, delivered by Professor Mumford at Harvard in 1963-1964, are devoted to a study of properties of families of algebraic curves, on a non-

singular projective algebraic curve defined over an algebraically closed field of arbitrary characteristic. The methods and techniques of Grothendieck, which have so changed the character of algebraic geometry in recent years, are used systematically throughout. Thus the classical material is presented from a new viewpoint.

Springer

This volume contains the expanded lectures given at a conference on number theory and arithmetic geometry held at Boston University. It introduces and explains the many ideas and techniques used by Wiles, and to explain how his result can be combined with Ribets theorem and ideas of Frey and Serre to prove Fermats Last Theorem. The book begins with an overview of the complete proof, followed by several introductory chapters surveying the basic theory of elliptic curves, modular functions and curves, Galois cohomology, and finite group schemes. Representation theory, which lies at the core of the proof, is dealt with in a chapter on automorphic representations and the Langlands-Tunnell theorem, and this is followed by in-depth discussions of Serres conjectures, Galois deformations, universal deformation rings, Hecke algebras, and complete intersections. The book concludes by looking both forward and backward, reflecting on the history of the problem, while placing Wiles'theorem into a more general Diophantine context suggesting future applications. Students and professional mathematicians alike will

find this an indispensable resource.
Earthquake and Volcano Deformation Elsevier
Derived algebraic geometry is a far-reaching generalization of algebraic geometry. It has found numerous applications in other parts of mathematics, most prominently in representation theory. This volume develops deformation theory, Lie theory and the theory of algebroids in the context of derived algebraic geometry. To that end, it introduces the notion of inf-scheme, which is an infinitesimal deformation of a scheme and studies ind-coherent sheaves on such. As an application of the general theory, the six-functor formalism for D-modules in derived geometry is obtained. This volume consists of two parts. The first part introduces the notion of ind-scheme and extends the theory of ind-coherent sheaves to inf-schemes, obtaining the theory of D-modules as an application. The second part establishes the equivalence between formal Lie group(oids) and Lie algebr(oids) in the category of ind-coherent sheaves. This equivalence gives a vast generalization of the equivalence between Lie algebras and formal moduli problems. This theory is applied to study natural filtrations in formal derived geometry generalizing the Hodge filtration.
Deformation Theory of Algebras and Their Diagrams Springer
The basic problem of deformation theory in algebraic geometry involves watching a small deformation of one member of a family of objects, such as varieties, or

subschemes in a fixed space, or vector bundles on a fixed scheme. In this new book, Robin Hartshorne studies first what happens over small infinitesimal deformations, and then gradually builds up to more global situations, using methods pioneered by Kodaira and Spencer in the complex analytic case, and adapted and expanded in algebraic geometry by Grothendieck. The author includes numerous exercises, as well as important examples illustrating various aspects of the theory. This text is based on a graduate course taught by the author at the University of California, Berkeley.

Deformation Theory of Algebraic and Geometric Structures CRC Press

Generally, welding produces welding deformation and residual stress in the products, which influences the quality and performance of the products. Although many engineers and researchers have made great effort how to control these incidents, they have still remained unresolved. Welding Deformation and Residual Stress Prevention provides a unique computational approach to the prediction of the effects of deformation and residual stress on materials. The goal is to provide engineers and designers with the ability to create their own computational system for predicting and possibly avoiding the problem altogether. The basic theories including "theory of elastic-plastic analysis" and "inherent strain theory" , and analysis procedures are described using a simple three-bar model. Online simulation

software to perform basic analysis on welding mechanics Examples of strategic methods and procedures are illustrated to have solved various welding-related problems encountered in the process of construction. Appendices present data bases for welding residual stresses, temperature dependent material properties, etc.

Deformation and Progressive Failure in Geomechanics Elsevier

Progressive failure has been a classical problem in the field of geotechnical engineering and has attracted considerable attention in connection with slope stability and foundation problems. It is associated with strain localization or shear banding and is also related to damage in material structures. As knowledge of the progressive failure mechanism increases, it is now necessary to establish effective communications between researchers and engineers. The International Symposium on Deformation and Progressive Failure in Geomechanics provided an opportunity for discussing recent advances in this area. A total of 136 papers were contributed from 22 countries. As well as these, the symposium proceedings also contain 8 interim technical reports on the subject by the members of the Asian Technical Committee of the International Society for Soil Mechanics and Foundation Engineering and the Japanese Geotechnical Society National Committee on Progressive Failure in Geo-structures.

Lie Methods in Deformation Theory

Springer Science & Business Media
Deformation of Metals during Rolling discusses the ductility of metal. The book explores the implication of the theory of flat cross section. The said theory explains that flat transverse-vertical cross-sections before deformation remain flat both in the zone of deformation and after rolling. Such theory has been accepted until some research appeared that opposed the basic view in the theory of rolling. Another theory discussed is the theory of inhomogeneous deformation. The book focuses on the fundamental hypotheses of the mechanics of continuous media. It also covers topics such as the creation of model of deformation that closely resembles the real conditions of the rolling process and the determination of boundary conditions. A section in the book presents information on the degree of the deformation of metal during compression. The text can be a good reference for industrial engineers and academic students doing research on the properties of steel and iron.
Complex Manifolds and Deformation of Complex Structures CRC Press
Most books on the theory and analysis of beams and plates deal with the classical (Euler-Bernoulli/Kirchoff) theories but few include shear deformation theories in detail. The classical beam/plate theory is not adequate in providing accurate bending, buckling, and vibration results when the thickness-to-length ratio of the beam/plate is relatively large. This is because the effect of transverse shear strains, neglected in the classical theory,

becomes significant in deep beams and thick plates. This book illustrates how shear deformation theories provide accurate solutions compared to the classical theory. Equations governing shear deformation theories are typically more complicated than those of the classical theory. Hence it is desirable to have exact relationships between solutions of the classical theory and shear deformation theories so that whenever classical theory solutions are available, the corresponding solutions of shear deformation theories can be readily obtained. Such relationships not only furnish benchmark solutions of shear deformation theories but also provide insight into the significance of shear deformation on the response. The relationships for beams and plates have been developed by many authors over the last several years. The goal of this monograph is to bring together these relationships for beams and plates in a single volume. The book is divided into two parts. Following the introduction, Part 1 consists of Chapters 2 to 5 dealing with beams, and Part 2 consists of Chapters 6 to 13 covering plates. Problems are included at the end of each chapter to use, extend, and develop new relationships.

Basic Concepts,Theory and Applications American Mathematical Soc.

The first instances of deformation theory were given by Kodaira and Spencer for complex structures and by Gerstenhaber for associative algebras. Since then, deformation theory has been applied as

a useful tool in the study of many other mathematical structures, and even today it plays an important role in many developments of modern mathematics. This volume collects a few self-contained and peer-reviewed papers by experts which present up-to-date research topics in algebraic and motivic topology, quantum field theory, algebraic geometry, noncommutative geometry and the deformation theory of Poisson algebras. They originate from activities at the Max-Planck-Institute for Mathematics and the Hausdorff Center for Mathematics in Bonn.

Introduction to Singularities and Deformations Princeton University Press

In the monograph a new approach to deformation quantization on a symplectic manifold is developed. This approach gives rise to an important invariant, the so-called Weyl curvature, which is a formal deformation of the symplectic form. The isomophy classes of the deformed algebras are classified by the cohomology classes of the coefficients of the Weyl curvature. These algebras have many common features with the algebra of complete symbols of pseudodifferential operators except that in general there are no corresponding operator algebras. Nevertheless, the developed calculus allows to define the notion of an elliptic element and its index as well as to prove an index theorem similar to that of Atiyah-Singer for elliptic operators. The corresponding index formula contains the Weyl curvature and the usual ingredients entering the Atiyah-Singer formula.

Applications of the index theorem are connected with the so-called asymptotic operator representation of the deformed algebra (the operator quantization), the formal deformation parameter h should be replaced by a numerical one ranging over some admissible set of the unit interval having 0 as its limit point. The fact that the index of any elliptic operator is an integer results in necessary quantization conditions: the index of any elliptic element should be asymptotically integer-valued as h tends to 0 over the admissible set. For a compact manifold a direct construction of the asymptotic operator representation shows that these conditions are also sufficient. Finally, a reduction theorem for deformation quantization is proved generalizing the classical Marsden-Weinstein theorem. In this case the index theorem gives the Bohr-Sommerfeld quantization rule and the multiplicities of eigenvalues.

An Integrated Creep-Fatigue Theory Springer Science & Business Media

Deformation TheorySpringer Science & Business Media

Unified Constitutive Laws of Plastic Deformation Elsevier

This volume is a result of a meeting which took place in June 1986 at 'll Ciocco" in Italy entitled 'Deformation theory of algebras and structures and applications'. It appears somewhat later than is perhaps desirable for a volume resulting from a summer school. In return it contains a good many results which were not yet available at the time of the meeting. In particular it is now

abundantly clear that the Deformation theory of algebras is indeed central to the whole philosophy of deformations/perturbations/stability. This is one of the main results of the 254 page paper below (practically a book in itself) by Gerstenhaber and Shack entitled "Algebraic cohomology and defor mation theory". Two of the main philosphical-methodological pillars on which deformation theory rests are the fol lowing • (Pure) To study a highly complicated object, it is fruitful to study the ways in which it can arise as a limit of a family of simpler objects: "the unraveling of complicated structures" . • (Applied) If a mathematical model is to be applied to the real world there will usually be such things as coefficients which are imperfectly known. Thus it is important to know how the behaviour of a model changes as it is perturbed (deformed).

Perspectives on algebro-geometric moduli Springer Science & Business Media

Due to plate motions, tidal effects of the Moon and the Sun, atmosphe ric, hydrological, ocean loading and local geological processes, and due to the rotation of the Earth, all points on the Earth's crust are sub ject to deformation. Global plate motion models, based on the ocean floor spreading rates, transform fault azimuths, and earthquake slip vectors, describe average plate motions for a time period of the past few million years. Therefore, the investigation of present-day tectonic activities by global plate motion models

in a small area with complex movements cannot supply satisfactory results. The contribution of space techniques [Very Long Baseline Interferome try (VLBI); Satellite Laser Ranging (SLR); Global Positioning System (GPS)] applied to the present-day deformations ofthe Earth's surface and plate tectonics has increased during the last 20 to 25 years. Today one is able to determine by these methods the relative motions in the em to sub-em-range between points far away from each other.

Algebraic Aspects of Complex Analysis Springer Science & Business Media

This book develops a novel approach to perturbative quantum field theory: starting with a perturbative formulation of classical field theory, quantization is achieved by means of deformation quantization of the underlying free theory and by applying the principle that as much of the classical structure as possible should be maintained. The resulting formulation of perturbative quantum field theory is a version of the Epstein-Glaser renormalization that is conceptually clear, mathematically rigorous and pragmatically useful for physicists. The connection to traditional formulations of perturbative quantum field theory is also elaborated on, and the formalism is illustrated in a wealth of examples and exercises.

Algebraic and Analytic Deformation Theory Springer Science & Business Media

This account of deformation theory in classical algebraic geometry over an

algebraically closed field presents for the first time some results previously scattered in the literature, with proofs that are relatively little known, yet relevant to algebraic geometers. Many examples are provided. Most of the algebraic results needed are proved. The style of exposition is kept at a level amenable to graduate students with an average background in algebraic geometry.

Deformation Theory of Plasticity World Scientific

Earthquake and Volcano Deformation is the first textbook to present the mechanical models of earthquake and volcanic processes, emphasizing earth-surface deformations that can be compared with observations from Global Positioning System (GPS) receivers, Interferometric Radar (InSAR), and borehole strain- and tiltmeters. Paul Segall provides the physical and mathematical fundamentals for the models used to interpret deformation measurements near active faults and volcanic centers. Segall highlights analytical methods of continuum mechanics applied to problems of active crustal deformation. Topics include elastic dislocation theory in homogeneous and layered half-spaces, crack models of faults and planar intrusions, elastic fields due to pressurized spherical and ellipsoidal magma chambers, time-dependent deformation resulting from faulting in an elastic layer overlying a viscoelastic half-space and related earthquake cycle models, poroelastic effects due to

faulting and magma chamber inflation in a fluid-saturated crust, and the effects of gravity on deformation. He also explains changes in the gravitational field due to faulting and magmatic intrusion, effects of irregular surface topography and earth curvature, and modern concepts in rate- and state-dependent fault friction. This textbook presents sample calculations and compares model predictions against field data from seismic and volcanic settings from around the world. Earthquake and Volcano Deformation requires working knowledge of stress and strain, and advanced calculus. It is appropriate for advanced undergraduates and graduate students in geophysics, geology, and engineering. Professors: A supplementary Instructor's Manual is available for this book. It is restricted to teachers using the text in courses. For information on how to obtain a copy, refer to: http://press.princeton.edu/class_use/solutions.html

Higher-Dimensional Algebraic Geometry Bull Ridge Corporation

This text investigates a natural question arising in the topological theory of 3-manifolds, and applies the results to give new information about the deformation theory of hyperbolic 3-manifolds. It is well known that some compact 3-manifolds with boundary admit homotopy equivalences that are not homotopic to homeomorphisms. We investigate when the subgroup $\mathcal{R}(M)$ of outer automorphisms of $\pi_1(M)$ which are

induced by homeomorphisms of a compact 3-manifold M has finite index in the group $\operatorname{Out}(\pi_1(M))$ of all outer automorphisms. This question is completely resolved for Haken 3-manifolds.It is also resolved for many classes of reducible 3-manifolds and 3-manifolds with boundary patterns, including all pared 3-manifolds. The components of the interior $\operatorname{GF}(\pi_1(M))$ of the space $\operatorname{AH}(\pi_1(M))$ of all (marked) hyperbolic 3-manifolds homotopy equivalent to M are enumerated by the marked homeomorphism types of manifolds homotopy equivalent to M, so one may apply the topological results above to study the topology of this deformation space.We show that $\operatorname{GF}(\pi_1(M))$ has finitely many components if and only if either M has incompressible boundary, but no 'double trouble', or M has compressible boundary and is 'small'. (A hyperbolizable 3-manifold with incompressible boundary has double trouble if and only if there is a thickened torus component of its characteristic submanifold which intersects the boundary in at least two annuli). More generally, the deformation theory of hyperbolic structures on pared manifolds is analyzed. Some expository sections detail Johannson's formulation of the Jaco-Shalen-Johannson characteristic submanifold theory, the topology of pared 3-manifolds, and the deformation theory of hyperbolic 3-

manifolds. An epilogue discusses related open problems and recent progress in the deformation theory of hyperbolic 3-manifolds.

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