# Modules Over Non Noetherian Domains Mathematical Surveys And Monographs

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## The Ricci Flow

## Papers from the "Open House for Algebraists"

This book provides the first systematic treatment of modules over discrete valuation domains which plays an important role in various areas of algebra, especially in commutative algebra. Many important results representing the state of the art are presented in the text which is supplemented by exercises and interesting open problems. An important contribution to commutative algebra.

## Noncommutative Noetherian Rings

This volume consists of twenty-one articles by many of the most prominent researchers in non-Noetherian commutative ring theory. The articles combine in various degrees surveys of past results, recent results that have never before seen print, open problems, and an extensive bibliography. One hundred open problems supplied by the authors have been collected in the volume's concluding chapter. The entire collection provides a comprehensive survey of the development of the field over the last ten years and

points to future directions of research in the area. Audience: Researchers and graduate students; the volume is an appropriate source of material for several semester-long graduate-level seminars and courses.

## Modules Over Non-Noetherian Domains

Vertex algebras were first introduced as a tool used in the description of the algebraic structure of certain quantum field theories. It became increasingly important that vertex algebras are useful not only in the representation theory of infinite-dimensional Lie algebras, where they are by now ubiquitous, but also in other fields, such as algebraic geometry, theory of finite groups, modular functions, and topology. This book is an introduction to the theory of vertex algebras with a particular emphasis on the relationship between vertex algebras and the geometry of moduli spaces of algebraic curves. The authors make the first steps toward reformulating the theory of vertex algebras in a way that is suitable for algebraic-geometric applications.

## Torsion-Free Modules

## Modules over Non-Noetherian Domains

Besides giving an introduction to Commutative Algebra - the theory of c- mutative rings - this book is devoted to the study of projective modules and the minimal number of generators of modules and ideals.

The notion of a module over a ring R is a generalization of that of a vector space over a field k. The axioms are identical. But whereas every vector space possesses a basis, a module need not always have one. Modules possessing a basis are called free. So a finitely generated free R-module is of the form Rn for some n E IN, equipped with the usual operations. A module is called p- jective, iff it is a direct summand of a free one. Especially a finitely generated R-module P is projective iff there is an R-module Q with P @ Q S Rn for some n. Remarkably enough there do exist nonfree projective modules. Even there are nonfree P such that P @ Rm S Rn for some m and n. Modules P having the latter property are called stably free. On the other hand there are many rings, all of whose projective modules are free, e. g. local rings and principal ideal domains. (A commutative ring is called local iff it has exactly one maximal ideal. ) For two decades it was a challenging problem whether every projective module over the polynomial ring k[X1,. . .

## Introduction to Noncommutative Algebra

This introduction to noncommutative noetherian rings is intended to be accessible to anyone with a basic background in abstract algebra. It can be used as a second-year graduate text, or as a self-contained reference. Extensive explanatory discussion is given, and exercises are integrated throughout. This edition incorporates substantial revisions, particularly in the first third of the book, where the presentation has been changed to increase accessibility and topicality.

New material includes the basic types of quantum groups, which then serve as test cases for the theory developed.

## Rings, Polynomials, and Modules

## Commutative Algebra and Its Applications

This is an updated edition of a work that was considered the definitive account in the subject area upon its initial publication by J. Wiley & Sons in 1987. It presents, within a wider context, a comprehensive account of noncommutative Noetherian rings. The author covers the major developments from the 1950s, stemming from Goldie's theorem and onward, including applications to group rings, enveloping algebras of Lie algebras, PI rings, differential operators, and localization theory. The book is not restricted to Noetherian rings, but discusses wider classes of rings where the methods apply more generally. In the current edition, some errors were corrected, a number of arguments have been expanded, and the references were brought up to date. This reprinted edition will continue to be a valuable and stimulating work for readers interested in ring theory and its applications to other areas of mathematics.

## Mathematical Reviews

## Bulletin Canadien de Mathématiques

## Rendiconti del Seminario matematico della Università di Padova

In this book, the authors present both traditional and modern discoveries in the subject area, concentrating on advanced aspects of the topic. Existing material is studied in detail, including finitely generated modules, projective and injective modules, and the theory of torsion and torsion-free modules. Some topics are treated from a new point of view. Also included are areas not found in current texts, for example, pure-injectivity, divisible modules, uniserial modules, etc. Special emphasis is given to results that are valid over arbitrary domains. The authors concentrate on modules over valuation and Prufer domains, but also discuss Krull and Matlis domains, $h$-local, reflexive, and coherent domains. The volume can serve as a standard reference book for specialists working in the area and also is a suitable text for advanced-graduate algebra courses and seminars.

## Pre-self-injective Rings and Projective Modules Over Semi-perfect Rings

Ideal for graduate students and researchers, this book presents a unified treatment of the central notions of integral closure.

## Acta Scientiarum Mathematicarum

This volume originated from talks given at the International Conference on Rings and Things held in June, 2007 at Ohio University - Zanesville. The papers in this volume contain the latest results in current active research areas in the theory of rings and modules, including non commutative and commutative ring theory, module theory, representation theory, and coding theory. In particular, papers in this volume deal with topics such as decomposition theory of modules, injectivity and generalizations, tilting theory, rings and modules with chain conditions, Leavitt path algebras, representations of finite dimensional algebras, and codes over rings. While most of these papers are original research articles, some are expository surveys. This book is suitable for graduate students and researchers interested in non commutative ring and module theory, representation theory, and applications.

## Rings, Modules, and Closure Operations

## Rings, Modules, and Representations

This book initiates a systematic, in-depth study of Modules Over Valuation Domains. It introduces the theory of modules over commutative domains without finiteness conditions and examines frontiers of current research in modules over valuation domains. It represents a unique effort to combine ideas from abelian group theory, in a large scale, with powerful techniques developed in module theory. This volume

surveys the background material on valuation rings, modules and homological algebra features new results for important classes of modules such as finitely generated, divisible, pure-injective, and projective dimension one -- never published before contains exercises and research problems -- offering guidance for independent and creative study and provides historical notes, comments, and an extensive bibliography. Mathematicians and advanced graduate-level mathematics students interested in module theory, abelian group theory, and commutative ring theory can stay abreast of the latest advances with Modules Over Valuation Domains. Book jacket.

## Models, Modules and Abelian Groups

## Invariant Theory of Finite Groups

## Modules over Non-Noetherian Domains

This volume presents a collection of articles highlighting recent developments in commutative algebra and related non-commutative generalizations. It also includes an extensive bibliography and lists a substantial number of open problems that point to future directions of research in the represented subfields. The contributions cover areas in commutative algebra that have flourished in the last few decades and are not yet well represented in book form. Highlighted topics and research methods

include Noetherian and non-Noetherian ring theory, module theory and integer-valued polynomials along with connections to algebraic number theory, algebraic geometry, topology and homological algebra. Most of the eighteen contributions are authored by attendees of the two conferences in commutative algebra that were held in the summer of 2016: “Recent Advances in Commutative Ring and Module Theory,” Bressanone, Italy; “Conference on Rings and Polynomials” Graz, Austria. There is also a small collection of invited articles authored by experts in the area who could not attend either of the conferences. Following the model of the talks given at these conferences, the volume contains a number of comprehensive survey papers along with related research articles featuring recent results that have not yet been published elsewhere.

## Commutative Algebra

## The Geometry of Syzygies

Contains Proceedings of the Canadian Mathematical Congress, 6th- 1963-

## Journal of mathematics of Kyoto University

## Rings, Modules, Algebras, and Abelian Groups

Providing an elementary introduction to noncommutative rings and algebras, this textbook begins with the classical theory of finite dimensional algebras. Only after this, modules, vector spaces over division rings, and tensor products are introduced and studied. This is followed by Jacobson's structure theory of rings. The final chapters treat free algebras, polynomial identities, and rings of quotients. Many of the results are not presented in their full generality. Rather, the emphasis is on clarity of exposition and simplicity of the proofs, with several being different from those in other texts on the subject. Prerequisites are kept to a minimum, and new concepts are introduced gradually and are carefully motivated. Introduction to Noncommutative Algebra is therefore accessible to a wide mathematical audience. It is, however, primarily intended for beginning graduate and advanced undergraduate students encountering noncommutative algebra for the first time.

## Papers from the "Open House for Algebraists"

An invaluable summary of research work done in the period from 1978 to the present

## Modules Over Discrete Valuation Domains

## Modules over Valuation Rings

The questions that have been at the center of

invariant theory since the 19th century have revolved around the following themes: finiteness, computation, and special classes of invariants. This book begins with a survey of many concrete examples chosen from these themes in the algebraic, homological, and combinatorial context. In further chapters, the authors pick one or the other of these questions as a departure point and present the known answers, open problems, and methods andtools needed to obtain these answers. Chapter 2 deals with algebraic finiteness. Chapter 3 deals with combinatorial finiteness. Chapter 4 presents Noetherian finiteness. Chapter 5 addresses homological finiteness. Chapter 6 presents special classes of invariants, which deal with modular invarianttheory and its particular problems and features. Chapter 7 collects results for special classes of invariants and coinvariants such as (pseudo) reflection groups and representations of low degree. If the ground field is finite, ad The book contains numerous examples to illustrate the theory, often of more than passing interest, and an appendix on commutative graded algebra, which provides some of the required basic background. There is an extensive reference list to provide the reader withorientation to the vast literature.

## Reviews in K-theory, 1940-84

## Book Review Index

Rings, Modules, Algebras, and Abelian Groups summarizes the proceedings of a recent algebraic

conference held at Venice International University in Italy. Surveying the most influential developments in the field, this reference reviews the latest research on Abelian groups, algebras and their representations, module and ring theory, and topological

## An Introduction to Noncommutative Noetherian Rings

Commutative algebra is a rapidly growing subject that is developing in many different directions. This volume presents several of the most recent results from various areas related to both Noetherian and non-Noetherian commutative algebra. This volume contains a collection of invited survey articles by some of the leading experts in the field. The authors of these chapters have been carefully selected for their important contributions to an area of commutative-algebraic research. Some topics presented in the volume include: generalizations of cyclic modules, zero divisor graphs, class semigroups, forcing algebras, syzygy bundles, tight closure, Gorenstein dimensions, tensor products of algebras over fields, as well as many others. This book is intended for researchers and graduate students interested in studying the many topics related to commutative algebra.

## Cotorsion Modules

'Book Review Index' provides quick access to reviews of books, periodicals, books on tape and electronic media representing a wide range of popular,

academic and professional interests. More than 600 publications are indexed, including journals and national general interest publications and newspapers. 'Book Review Index' is available in a three-issue subscription covering the current year or as an annual cumulation covering the past year.

## Non-Noetherian Commutative Ring Theory

This book presents a systematic exposition of the various applications of closure operations in commutative and noncommutative algebra. In addition to further advancing multiplicative ideal theory, the book opens doors to the various uses of closure operations in the study of rings and modules, with emphasis on commutative rings and ideals. Several examples, counterexamples, and exercises further enrich the discussion and lend additional flexibility to the way in which the book is used, i.e., monograph or textbook for advanced topics courses.

## Ideals and Reality

The subject of torsion-free modules over an arbitrary integral domain arises naturally as a generalization of torsion-free abelian groups. In this volume, Eben Matlis brings together his research on torsion-free modules that has appeared in a number of mathematical journals. Professor Matlis has reworked many of the proofs so that only an elementary knowledge of homological algebra and commutative ring theory is necessary for an understanding of the

theory. The first eight chapters of the book are a general introduction to the theory of torsion-free modules. This part of the book is suitable for a self-contained basic course on the subject. More specialized problems of finding all integrally closed D-rings are examined in the last seven chapters, where material covered in the first eight chapters is applied. An integral domain is said to be a D-ring if every torsion-free module of finite rank decomposes into a direct sum of modules of rank 1. After much investigation, Professor Matlis found that an integrally closed domain is a D-ring if, and only if, it is the intersection of at most two maximal valuation rings.

## Integral Closure of Ideals, Rings, and Modules

This volume contains selected refereed papers based on lectures presented at the Fifth International Fez Conference on Commutative Algebra and Applications that was held in Fez, Morocco in June 2008. The volume represents new trends and areas of classical research within the field, with contributions from many different countries. In addition, the volume has as a special focus the research and influence of Alain Bouvier on commutative algebra over the past thirty years. "

## Abstracts of Papers Presented to the American Mathematical Society

## SIAM Journal on Control and Optimization

First textbook-level account of basic examples and techniques in this area. Suitable for self-study by a reader who knows a little commutative algebra and algebraic geometry already. David Eisenbud is a well-known mathematician and current president of the American Mathematical Society, as well as a successful Springer author.

## Progress in Commutative Algebra 2

This is a memorial volume dedicated to A. L. S. Corner, previously Professor in Oxford, who published important results on algebra, especially on the connections of modules with endomorphism algebras. The volume contains refereed contributions which are related to the work of Corner. It contains also an unpublished extended paper of Corner himself. A memorial volume with important contributions related to algebra.

## Vertex Algebras and Algebraic Curves

## Comprehensive Dissertation Index, 1861-1972: Mathematics and statistics

In this book, the authors present both traditional and modern discoveries in the subject area, concentrating on advanced aspects of the topic. Existing material is studied in detail, including finitely generated modules, projective and injective modules, and the theory of torsion and torsion-free modules. Some topics are treated from a new point of view. Also included are

areas not found in current texts, for example, pure-injectivity, divisible modules, uniserial modules, etc. Special emphasis is given to results that are valid over arbitrary domains. The authors concentrate on modules over valuation and Prufer domains, but also discuss Krull and Matlis domains, $h$-local, reflexive, and coherent domains. The volume can serve as a standard reference book for specialists working in the area and also is a suitable text for advanced-graduate algebra courses and seminars.

## Serre's Problem on Projective Modules

In this book, the authors present both traditional and modern discoveries in the subject area, concentrating on advanced aspects of the topic. Existing material is studied in detail, including finitely generated modules, projective and injective modules, and the theory of torsion and torsion-free modules. Some topics are treated from a new point of view. Also included are areas not found in current texts, for example, pure-injectivity, divisible modules, uniserial modules, etc. Special emphasis is given to results that are valid over arbitrary domains. The authors concentrate on modules over valuation and Prufer domains, but also discuss Krull and Matlis domains, $h$-local, reflexive, and coherent domains. The volume can serve as a standard reference book for specialists working in the area and also is a suitable text for advanced-graduate algebra courses and seminars.

## Mathematica Scandinavica

This is the second of two volumes of a state-of-the-art survey article collection which emanates from three commutative algebra sessions at the 2009 Fall Southeastern American Mathematical Society Meeting at Florida Atlantic University. The articles reach into diverse areas of commutative algebra and build a bridge between Noetherian and non-Noetherian commutative algebra. The current trends in two of the most active areas of commutative algebra are presented: non-noetherian rings (factorization, ideal theory, integrality), advances from the homological study of noetherian rings (the local theory, graded situation and its interactions with combinatorics and geometry). This second volume discusses closures, decompositions, and factorization.