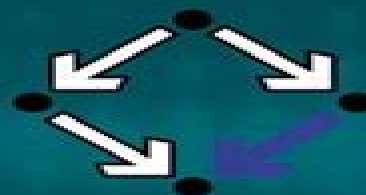


Texts & Monographs in Symbolic Computation

Bernd Sturmfels

# Algorithms in Invariant Theory

2nd Edition



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# Algorithms In Invariant Theory

**H.E.A. Eddy Campbell, David L. Wehlau**



## Algorithms In Invariant Theory:

**Algorithms in Invariant Theory** Bernd Sturmfels, 2008-06-17 J Kung and G C Rota in their 1984 paper write Like the Arabian phoenix rising out of its ashes the theory of invariants pronounced dead at the turn of the century is once again at the forefront of mathematics The book of Sturmfels is both an easy to read textbook for invariant theory and a challenging research monograph that introduces a new approach to the algorithmic side of invariant theory The Groebner bases method is the main tool by which the central problems in invariant theory become amenable to algorithmic solutions Students will find the book an easy introduction to this classical and new area of mathematics Researchers in mathematics symbolic computation and computer science will get access to a wealth of research ideas hints for applications outlines and details of algorithms worked out examples and research problems *Algorithms in Invariant Theory* Look Kwang Wong, 1998

*Computational Invariant Theory* Harm Derksen, Gregor Kemper, 2015-12-23 This book is about the computational aspects of invariant theory Of central interest is the question how the invariant ring of a given group action can be calculated Algorithms for this purpose form the main pillars around which the book is built There are two introductory chapters one on Gr bner basis methods and one on the basic concepts of invariant theory which prepare the ground for the algorithms Then algorithms for computing invariants of finite and reductive groups are discussed Particular emphasis lies on interrelations between structural properties of invariant rings and computational methods Finally the book contains a chapter on applications of invariant theory covering fields as disparate as graph theory coding theory dynamical systems and computer vision The book is intended for postgraduate students as well as researchers in geometry computer algebra and of course invariant theory The text is enriched with numerous explicit examples which illustrate the theory and should be of more than passing interest More than ten years after the first publication of the book the second edition now provides a major update and covers many recent developments in the field Among the roughly 100 added pages there are two appendices authored by Vladimir Popov and an addendum by Norbert A Campo and Vladimir Popov *Computational Invariant Theory* Harm Derksen, Gregor Kemper, 2013-04-17 Invariant theory is a subject with a long tradition and an astounding ability to rejuvenate itself whenever it reappears on the mathematical stage Throughout the history of invariant theory two features of it have always been at the center of attention computation and applications This book is about the computational aspects of invariant theory We present algorithms for calculating the invariant ring of a group that is linearly reductive or finite including the modular case These algorithms form the central pillars around which the book is built To prepare the ground for the algorithms we present Gr bner basis methods and some general theory of invariants Moreover the algorithms and their behavior depend heavily on structural properties of the invariant ring to be computed Large parts of the book are devoted to studying such properties Finally most of the applications of invariant theory depend on the ability to calculate invariant rings The last chapter of this book provides a sample of applications inside and outside of mathematics

**Algorithms in Invariant Theory and Quasi-minimal Bracket Expressions** Leland McInnes, 2000

**Invariant Theory in All Characteristics** Harold Edward Alexander Eddy Campbell, David L. Wehlau, 2004 This volume includes the proceedings of a workshop on Invariant Theory held at Queen's University Ontario The workshop was part of the theme year held under the auspices of the Centre de recherches mathématiques CRM in Montreal The gathering brought together two communities of researchers those working in characteristic 0 and those working in positive characteristic The book contains three types of papers survey articles providing introductions to computational invariant theory modular invariant theory of finite groups and the invariant theory of Lie groups expository works recounting recent research in these three areas and beyond and open problems of current interest The book is suitable for graduate students and researchers working in invariant theory

**Classical Invariant Theory** Peter J. Olver, 1999-01-13 The book is a self contained introduction to the results and methods in classical invariant theory

**Modular Invariant Theory** H.E.A. Eddy Campbell, David L. Wehlau, 2011-01-12 This book covers the modular invariant theory of finite groups the case when the characteristic of the field divides the order of the group a theory that is more complicated than the study of the classical non modular case Largely self contained the book develops the theory from its origins up to modern results It explores many examples illustrating the theory and its contrast with the better understood non modular setting It details techniques for the computation of invariants for many modular representations of finite groups especially the case of the cyclic group of prime order It includes detailed examples of many topics as well as a quick survey of the elements of algebraic geometry and commutative algebra as they apply to invariant theory The book is aimed at both graduate students and researchers an introduction to many important topics in modern algebra within a concrete setting for the former an exploration of a fascinating subfield of algebraic geometry for the latter

**Lectures on Invariant Theory** Igor Dolgachev, 2003-08-07 The primary goal of this 2003 book is to give a brief introduction to the main ideas of algebraic and geometric invariant theory It assumes only a minimal background in algebraic geometry algebra and representation theory Topics covered include the symbolic method for computation of invariants on the space of homogeneous forms the problem of finite generatedness of the algebra of invariants the theory of covariants and constructions of categorical and geometric quotients Throughout the emphasis is on concrete examples which originate in classical algebraic geometry Based on lectures given at University of Michigan Harvard University and Seoul National University the book is written in an accessible style and contains many examples and exercises A novel feature of the book is a discussion of possible linearizations of actions and the variation of quotients under the change of linearization Also includes the construction of toric varieties as torus quotients of affine spaces

**Invariant Theory of Finite Groups** Mara D. Neusel, Larry Smith, 2010-03-08 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 and tools 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 invariant theory 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 additional problems appear and are compensated for in part by the emergence of new tools One of these is the Steenrod algebra which the authors introduce in Chapter 8 to solve the inverse invariant theory problem around which the authors have organized the last three chapters 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 with orientation to the vast literature

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web fractional crystallization lab calculations 14th international symposium on industrial crystallization sep 25 2022 this conference provides a forum for discussion of the advances in the theory and practice of crystallization as it relates to the production of bulk crystalline materials crystallization apr 01 2023

**fractional crystallization chemistry wikipedia** - Jan 28 2023

web in chemistry fractional crystallization is a method of refining substances based on differences in their solubility it fractionates via differences in crystallization forming of crystals