Vector Fields On Singular Varieties Lecture Notes In Mathematics

Many examples, such as toric varieties and flag varieties, are discussed in detail. This theory contains geometric invariant theory with various applications to problems of moduli theory. M. McGovern studies the actions of a semisimple Lie or algebraic group on its Lie algebra via the adjoint action and on itself via conjugation. Bialynicki-Birula is to present the main trends and achievements of research in the theory of quotients by actions of algebraic groups. His contribution focuses primarily on nilpotent orbits that have found the widest application to representation theory in the last thirty-five years. This is the second volume of the new subseries \"Invariant Theory and Algebraic Transformation Groups\". The aim of the survey by A. The contribution by J. Carrell treats the subject of torus actions on algebraic varieties, giving a detailed exposition of many of the cohomological results one obtains from having a torus action with fixed points. W 890bdc9059

Vector fields on manifolds play a major role in mathematics and other sciences. -H. The interplay between these two methods is one of the main features of the monograph. We present these notions in the framework of the obstruction theory and the Chern-Weil theory. MacPherson. It is natural to ask what is the ‘good’ notion of the index of a vector field, and of Chern classes, if the underlying space becomes singular. Schwartz and R. The question has been explored by several authors resulting in various answers, starting with the pioneering work of M. In particular, the Poincaré-Hopf index theorem gives rise to the theory of Chern classes, key manifold-invariants in geometry and topology 890bdc9059

The first expository book-length introduction to intersection homology from the viewpoint of singular and piecewise linear chains 890bdc9059

Issues of (3) stringy corrections and (4) moduli space and its geometry are still in the stage of rapid and continuing development, whence there is more emphasis on open problems here. The level of mathematics is guided and developed between that of the popular Physics Reports of Eguchi, Gilkey and Hanson and the book Superstrings (Vol. The Book also contains a Lexicon (28 pages) of 150 assorted terms, key-words and main results and theorems, well suited for a handy reference. Although cross-referenced with the main part of the Book, the Lexicon can also be used independently. Finally, several detailed models and sample computations are included throughout the Book to exemplify the techniques and the general discussion. In the main part of the Book, collected and reviewed are relevant results on (1) several major techniques of constructing such spaces and (2) computation of physically relevant quantities such as massless field spectra and their Yukawa interactions. Also is included a preliminary discussion of the conjectured universal moduli space and related open problems. This is the first systematic exposition in book form of the material on Calabi-Yau spaces, related mathematics and the physics application, otherwise scattered through research articles in journals and conference proceedings. 2) by Green, Schwarz and Witten on one end and Principles of Algebraic Geometry of Griffiths and Harris on the other. Calabi-Yau spaces are complex spaces with a vanishing first Chern class, or equivalently, with trivial canonical bundle (canonical class). They are used to construct possibly realistic (super)string models and are thus being studied vigorously in the recent physics literature 890bdc9059

It is clear that this book is a valuable reference for all those interested in flag varieties and representation theory in the semi-simple or Kac-Moody case. \"Most of these topics appear here for the first time in book form. \" —MATHEMATICAL REVIEWS \"A lot of different topics are treated in this monumental work. Many of them are interesting even in the classical case of semi-simple algebraic groups. many of the topics of the book will be useful for those only interested in the finite-dimensional case. Some appendices recall useful results from other areas, so the work may be considered self-contained, although some familiarity with semi-simple Lie algebras or algebraic groups is helpful. For the motivated reader who is willing to spend considerable time on the material, the book can be a gold mine. \" —ZENTRALBLATT MATH. The book is self contained, but is on the level of advanced graduate students 890bdc9059

Proofs or sketches are given for many important results. It is aimed at graduate students and researchers in geometry and string theory. \" --MATHEMATICAL REVIEWS. This is an excellent and useful book. This is an introduction to a very active field of research, on the boundary between mathematics and physics. From the reviews: \"An excellent introduction to current research in the geometry of Calabi-Yau manifolds, hyper-Kähler manifolds, exceptional holonomy and mirror symmetry 890bdc9059

This volume contains the proceedings of the Workshop on Topology held at the Pontificia Universidade Catolica in Rio de Janeiro in January 1992. Also presented here are two surveys on group actions---finite group actions and rigidity theory for Anosov actions---as well as an elementary survey of Thurston's geometric topology in dimensions 2 and 3 that would be accessible to advanced undergraduates and graduate students. Bringing together about one hundred mathematicians from Brazil and around the world, the workshop covered a variety of topics in differential and algebraic topology, including group actions, foliations, low-dimensional topology, and connections to differential geometry. The main concentration was on foliation theory, but there was a lively exchange on other current topics in topology. The volume contains an excellent list of open problems in foliation research, prepared with the participation of some of the top world experts in this area 890bdc9059

Also included are articles from notes of two special lectures. This book presents the proceedings from the conference on algebraic geometry in honor of Professor Friedrich Hirzebruch's 70th Birthday. The second article contains notes from the talk delivered at the conference by Professor Hirzebruch. Contributors to the volume are leading researchers in the field. Topics covered in the book include intersection theory, singularities, low-dimensional manifolds, moduli spaces, number theory, and interactions between mathematical physics and geometry. Atiyah, describes the important contributions to the field of geometry by Professor Hirzebruch. The first, by Professor M. The event was held at the Stefan Banach International Mathematical Center in Warsaw (Poland) 890bdc9059

This is the fourth volume of the Handbook of Geometry and Topology of Singularities, a series that aims to provide an accessible account of the state of the art of the subject, its frontiers, and its interactions with other areas of research. Singularities are ubiquitous in mathematics and science in general. Some of these complement topics previously explored in volumes I to III. Authored by world experts, the various contributions deal with both classical material and modern developments, covering a wide range of topics which are linked to each other in fundamental ways. Amongst the topics studied in this volume are the Nash blow up, the space of arcs in algebraic varieties, determinantal singularities, Lipschitz geometry, indices of vector fields and 1-forms, motivic characteristic classes, the Hilbert-Samuel multiplicity and comparison theorems that spring from the classical De Rham complex. This volume consists of twelve chapters which provide an in-depth and reader-friendly survey of various important aspects of singularity theory. The book is addressed to graduate students and newcomers to the theory, as well as to specialists who can use it as a guidebook. Singularity theory is a crucible where different types of mathematical problems interact, surprising connections are born and simple questions lead to ideas which resonate in other subjects 890bdc9059

More than 180 mathematicians from over 30 countries converged to discuss recent developments in singularity theory. The subjects range from geometry and topology of singularities, through real and complex singularities, to applications of singularities. The volume contains the elementary and advanced courses conducted by singularities specialists during the conference, general lectures on singularity theory, and lectures on applications of the theory to various domains. The Singularity School and Conference took place in Luminy, Marseille, from January 24th to February 25th 2005 890bdc9059

This volume contains papers based on presentations given at the Pan-American Advanced Studies Institute (PASI) on commutative algebra and its connections to geometry, which was held August 3-14, 2009, at the Universidade Federal de Pernambuco in Olinda, Brazil. The main goal of the program was to detail recent developments in commutative algebra and interactions with such areas as algebraic geometry, combinatorics and computer algebra. The articles in this volume concentrate on topics central to modern commutative algebra: the homological conjectures, problems in positive and mixed characteristic, tight closure and its interaction with birational geometry, integral dependence and blowup algebras, equisingularity theory, Hilbert functions and multiplicities, combinatorial commutative algebra, Grobner bases and computational algebra 890bdc9059

This collection of surveys present an overview of recent developments in Complex Geometry. Topics range from curve and surface theory through special varieties in higher dimensions, moduli theory, Kähler geometry, and group actions to Hodge theory and characteristic p-geometry. Written by established experts this book will be a must for mathematicians working in Complex Geometry 890bdc9059

This volume includes three surveys of recent trends based on the lectures in the mini-school organized in the first two days of the symposium and articles presenting recent progress in Singularity Theory. The main theme of the symposium was Singularity Theory in a broad sense, including complex and real algebraic varieties, functions and mappings, and topology of singularities. The symposium was based on long-term interaction of singularity theorists in France, Japan, Vietnam and other countries. This is a proceedings of the 5th Franco-Japanese-Vietnamese Symposium on Singularities held in Kagoshima during 27th October - 3rd November, 2017 890bdc9059

Mathematics of Complexity and Dynamical Systems 890bdc9059

With its coverage of the various perspectives of a wide area of topics such as Hodge theory, Gross–Siebert program, moduli problems, toric approach, and arithmetic aspects, the book gives a comprehensive overview of the current streams of mathematical research in the area. ” The book is ideal for graduate students and researchers learning about Calabi–Yau varieties as well as physics students and string theorists who wish to learn the mathematics behind these varieties. The contributions in this book are based on lectures that took place during workshops with the following thematic titles: “Modular Forms Around String Theory,” “Enumerative Geometry and Calabi–Yau Varieties,” “Physics Around Mirror Symmetry,” “Hodge Theory in String Theory. This volume presents a lively introduction to the rapidly developing and vast research areas surrounding Calabi–Yau varieties and string theory 890bdc9059

The tenth meeting, celebrating the 60th birthdays of Terence Gaffney and Maria Aparecida Soares Ruas, was a special occasion attracting the best known names in the area. The biennial meetings at São Carlos have helped create a worldwide community of experts and young researchers working on singularity theory, with a special focus on applications to a wide variety of topics in both pure and applied mathematics. This volume contains contributions by the attendees, including three articles written or co-authored by Gaffney himself, and survey articles on the existence of Milnor fibrations, global classifications and graphs, pairs of foliations on surfaces, and Gaffney's work on equisingularity 890bdc9059

This Ergebnisse volume provides the first systematic introduction to this field of study. The book contains a large number of examples and exercises which serve to illustrate the range of the methods and also lead to many open questions of current research. The main applications are in the study of Fano varieties and of related varieties with lots of rational curves on them. The aim of this book is to provide an introduction to the structure theory of higher dimensional algebraic varieties by studying the geometry of curves, especially rational curves, on varieties 890bdc9059

This led to the realization that the time is ripe for mathematicians, armed with many concrete examples and alerted by the mirror symmetry phenomenon, to focus on Calabi-Yau varieties and to test for these special varieties some of the great outstanding conjectures, e. The developments in physics stimulated the interest of mathematicians in Calabi-Yau varieties. g. One of the significant outcomes of the workshop is that we are finally beginning to understand the mirror symmetry phenomenon from the arithmetic point of view, namely, in terms of zeta-functions and L-series of mirror pairs of Calabi-Yau threefolds. It has inspired many new developments in algebraic and arithmetic geometry, toric geometry, the theory of Riemann surfaces, and infinite-dimensional Lie algebras among others. The papers are divided roughly into two categories: geometric methods and arithmetic methods. The book is suitable for

researchers interested in mirror symmetry and string theory. The articles in this volume report on current developments. , the modularity conjecture for Calabi-Yau threefolds defined over the rationals, the Bloch-Beilinson conjectures, regulator maps of higher algebraic cycles, Picard-Fuchs differential equations, GKZ hypergeometric systems, and others. The idea of mirror symmetry originated in physics, but in recent years, the field of mirror symmetry has exploded onto the mathematical scene 890bdc9059

In the second edition some of the concepts in Poisson geometry are clarified by introducting Poisson cohomology; the Mumford systems are constructed from the algebra of pseudo-differential operators, which clarifies their origin; a new explanation of the multi Hamiltonian structure of the Mumford systems is given by using the loop algebra of sl(2); and finally Goedesic flow on SO(4) is added to illustrate the linearizatin algorith and to give another application of integrable systems to algebraic geometry. This book treats the general theory of Poisson structures and integrable systems on affine varieties in a systematic way. Several integrable systems are constructed and studied in detail and a few applications of integrable systems to algebraic geometry are worked out. Special attention is drawn to algebraic completely integrable systems 890bdc9059

The papers deal with all the different topics in singularity theory and its applications, from pure singularity theory related to commutative algebra and algebraic geometry to those topics associated with various aspects of geometry to homotopytheory. P. This book offers a selection of papers based on talks at the Ninth International Workshop on Real and Complex Singularities, a series of biennial workshops organized by the Singularity Theory group at Sao Carlos, S. , Brazil 890bdc9059

It also contains present new techniques for researchers working in this area. The reader should have a basic knowledge of algebraic geometry and non-linear analysis. This book can form the basis for graduate level seminars in the area of topology of algebraic varieties. Using harmonic maps, non-linear PDE and techniques from algebraic geometry this book enables the reader to study the relation between fundamental groups and algebraic geometry invariants of algebraic varieties 890bdc9059

Surveys research over the past few years at a level accessible to graduate students and researchers with a background in differential and Riemannian geometry. , Portland, OR. The bibliographic appendices list books and surveys on particular aspects of foliations, proceedings of conferences and symposia, all papers on the subject up to 1995, and the numbers of papers published on the subject during the years 1990-95. Annotation copyrighted by Book News, Inc. Among the topics are foliations of codimension one, holonomy, Lie foliations, basic forms, mean curvature, the Hodge theory for the transversal Laplacian, applications of the heat equation method to

Riemannian foliations, the spectral theory, Connes' perspective of foliations as examples of non- commutative spaces, and infinite-dimensional examples 890bdc9059

It also contains original contributions in the aforementioned areas written by renowned specialists. Specifically, the book introduces p-adic analysis, the theory of Archimedean, p-adic, and motivic zeta functions, singularities of plane curves and their Poincaré series, among other similar topics. This book is an important reference for students and experts who want to delve quickly into the area of local zeta functions and their many connections in mathematics and theoretical physics. At the mathematical level, local zeta functions contain geometry and arithmetic information about the set of zeros defined by a finite number of polynomials. This volume provides a gentle introduction to a very active area of research that lies at the intersection of number theory, p-adic analysis, algebraic geometry, singularity theory, and theoretical physics. The main purpose of the book is to present and analyze different incarnations of the local zeta functions and their multiple connections in mathematics and theoretical physics. This volume contains the proceedings of the 2019 Lluís A. Local zeta functions are ubiquitous objects in mathematics and theoretical physics. In terms of applications in theoretical physics, these functions play a central role in the regularization of Feynman amplitudes and Koba-Nielsen-type string amplitudes, among other applications. Santaló Summer School on p-Adic Analysis, Arithmetic and Singularities, which was held from June 24–28, 2019, at the Universidad Internacional Menéndez Pelayo, Santander, Spain 890bdc9059

\u200bThis volume was produced in conjunction with the Thematic Program in o-Minimal Structures and Real Analytic Geometry, held from January to June of 2009 at the Fields Institute. The sixth contribution, by Antongiulio Fornasiero and Tamara Servi, is an adaptation to the nonstandard setting of A. Wilkie's construction of o-minimal structures from infinitely differentiable functions. \u200b. Most of this material is either unavailable elsewhere or spread across many different sources such as research papers, conference proceedings and PhD theses. This book will be a useful tool for graduate students or researchers from related fields who want to learn about expansions of o-minimal structures by solutions, or images thereof, of definable systems of differential equations. Five of the six contributions consist of notes from graduate courses associated with the program: Felipe Cano on a new proof of resolution of singularities for planar analytic vector fields; Chris Miller on o-minimality and Hardy fields; Jean-Philippe Rolin on the construction of o-minimal structures from quasianalytic classes; Fernando Sanz on non-oscillatory trajectories of vector fields; and Patrick Speissegger on pfaffian sets. J 890bdc9059

This unique volume presents a collection of recent original research by some of the leading figures in singularity theory on a broad range of topics including topological and algebraic aspects, classification problems, deformation theory and resolution of singularities. Greuel himself made major contributions to the development of both singularity theory and computer algebra. The book addresses researchers whose work involves singularity theory and computer algebra from the PhD to expert level. With Gerhard Pfister and Hans Schönemann, he developed the computer algebra system SINGULAR, which has since become the computational tool of choice for many singularity theorists. This book arose from a conference on “Singularities and Computer Algebra” which was held at the Pfalz-Akademie Lambrecht in June 2015 in honor of Gert-Martin Greuel’s 70th birthday. At the same time, the articles highlight a variety of techniques, ranging from theoretical methods to practical tools from computer algebra 890bdc9059

The more than 100 entries in this wide-ranging, single source work provide a comprehensive explication of the theory and applications of mathematical complexity, covering ergodic theory, fractals and multifractals, dynamical systems, perturbation theory, solitons, systems and control theory, and related topics. Mathematics of Complexity and Dynamical Systems is an essential reference for all those interested in mathematical complexity, from undergraduate and graduate students up through professional researchers. the spontaneous formation of temporal, spatial or functional structures. Complex systems are systems that comprise many interacting parts with the ability to generate a new quality of collective behavior through self-organization, e. Mathematics of Complexity and Dynamical Systems is an authoritative reference to the basic tools and concepts of complexity, systems theory, and dynamical systems from the perspective of pure and applied mathematics. These systems are often characterized by extreme sensitivity to initial conditions as well as emergent behavior that are not readily predictable or even completely deterministic. g 890bdc9059

F. Gondard- Cozette; I. Degtyarev; Z. -P. Akbulut and H. Mikhalkin; T. Brumfield; A. Jaworski; A. M. Denkowska; J. Itenberg; P. Marshall and L. : On the classification of decomposing plane algebraic curves. : Real algebra and its applications to geometry in the last ten years: some major developments and results. - Scheiderer, C. Ueno; D. Reguiat; A. W. Vorobjov. Ruiz; A. Rannou; E. Coste and M. Spodzieja; K. Gamboa and C. Charzynski and P. Br|cker; G. Skibinski; M. Shustin; N. Lombardi; M. : Topology of real plane algebraic curves. Castilla; Z. Knebusch: Semialgebraic topology in the last ten years. Ten years after the first Rennes international meeting on real algebraic geometry, the second one looked at the developments in the subject during the intervening decade - see the 6 survey papers listed below. L. Ronga; J. Korchagin; T. Further contributions from the participants on recent research covered real algebra and geometry, topology of real algebraic varieties and 16thHilbert problem, classical algebraic geometry, techniques in real

algebraic geometry, algorithms in real algebraic geometry, semialgebraic geometry, real analytic geometry. M. Walter; V. CONTENTS: Survey papers: M. Francoise and F. Borobia; L. Parimala: Algebraic and topological invariants of real algebraic varieties. - Silhol, R. V. I. Kurdyka; H. Andradas and J. : Moduli problems in real algebraic geometry. - Shustin, E. Krasinksi and S. - Polotovskii, G. - R. Mazurovskii; G. Mostowski and E. Further contributions by: S. King; C 890bdc9059

The Lipschitz geometry of a singular space germ is then its equivalence class in this category. While a real or complex algebraic variety is topologically locally conical, it is in general not metrically conical; there are parts of its link with non-trivial topology which shrink faster than linearly when approaching the special point. The essence of the Lipschitz geometry of singularities is captured by the problem of building classifications of the germs up to local bi-Lipschitz homeomorphism. This book presents a broad overview of the important recent progress which led to the emergence of new ideas in Lipschitz geometry and singularities, and started to build bridges to several major areas of singularity theory. Providing all the necessary background in a series of introductory lectures, it also contains Pham and Teissier's previously unpublished pioneering work on the Lipschitz classification of germs of plane complex algebraic curves. The book is aimed at graduate students and researchers from other fields of geometry who are interested in studying the multiple open questions offered by this new subject 890bdc9059

This volume consists of ten articles which provide an in-depth and reader-friendly survey of some of the foundational aspects of singularity theory. The book is addressed to graduate students and newcomers to the theory, as well as to specialists who can use it as a guidebook. Singularities are ubiquitous in mathematics and science in general. Authored by world experts, the various contributions deal with both classical material and modern developments, covering a wide range of topics which are linked to each other in fundamental ways. Singularity theory interacts energetically with the rest of mathematics, acting as a crucible where different types of mathematical problems interact, surprising connections are born and simple questions lead to ideas which resonate in other parts of the subject. This is the first volume in a series which aims to provide an accessible account of the state-of-the-art of the subject, its frontiers, and its interactions with other areas of research 890bdc9059

This book offers students and specialists alike a broad perspective of algebraic cycles, presented from several viewpoints, including arithmetic, transcendental, topological, motives and K-theory methods. Topics include a discussion of the arithmetic Abel-Jacobi mapping, higher Abel-Jacobi regulator maps, polylogarithms and L-series, candidate Bloch-Beilinson filtrations, applications of Chern-Simons invariants to algebraic cycles via the study of algebraic vector bundles with algebraic connection, motivic cohomology, Chow

groups of singular varieties, and recent progress on the Hodge and Tate conjectures for Abelian varieties. The immense recent progress in algebraic cycles, based on so many interactions with so many other areas of mathematics, has contributed to a considerable degree of inaccessibility, especially for graduate students. These interactions have led to such developments as a description of Chow groups in terms of algebraic K-theory, the arithmetic Abel-Jacobi mapping, progress on the celebrated conjectures of Hodge and Tate, and the conjectures of Bloch and Beilinson. Even specialists in one approach to algebraic cycles may not understand other approaches well. The subject of algebraic cycles has thrived through its interaction with algebraic K-theory, Hodge theory, arithmetic algebraic geometry, number theory, and topology 890bdc9059

This book collects independent contributions on current developments in quantum information theory, a very interdisciplinary field at the intersection of physics, computer science and mathematics. Making intense use of the most advanced concepts from each discipline, the authors give in each contribution pedagogical introductions to the main concepts underlying their present research and present a personal perspective on some of the most exciting open problems. At the same time, the volume can also be of use to physicists wishing to learn advanced mathematical tools, especially of differential and algebraic geometric nature. Keeping this diverse audience in mind, special efforts have been made to ensure that the basic concepts underlying quantum information are covered in an understandable way for mathematical readers, who can find there new open challenges for their research 890bdc9059

R. Del Centina, S. - R. Pelikaan: Fitting ideals and multiple points of analytic mappings (55 pp. R.). Schreyer: Certain Weierstrass points occurr at most once on a curve. Smith, H. - C. From the contents: G. Gomez-Mont: On closed leaves of holomorphic foliations by curves (38 pp. Recillas: On a property of the Kummer variety and a relation between two moduli spaces of curves. Tapia-Recillas: The Gauss map on subvarieties of Jacobians of curves with gd2's. - G. Kempf: Fay's trisecant formula. Brambila: Existence of certain universal extensions. Mond, R. Kempf: The addition theorem for abstract Theta functions.). - D. - L. - F. - A. O 890bdc9059

Torsors, also known as principal bundles or principal homogeneous spaces, are ubiquitous in mathematics. Part two of the book features a milestone paper on the tale homotopy approach to the arithmetic of rational points. Furthermore, the reader will find a collection of research articles on algebraic groups and homogeneous spaces, rational and K3 surfaces, geometric invariant theory, rational points, descent, and the Brauer-Manin obstruction. The purpose of this book is to present expository lecture notes and cutting-edge research papers on the theory and applications of torsors and tale homotopy, all written from different perspectives by leading experts. Part one of the book contains lecture notes on recent uses of torsors in geometric invariant theory and representation theory,

plus an introduction to the tale homotopy theory of Artin and Mazur. Together, these give a state-of-the-art view of a broad area at the crossroads of number theory and algebraic geometry 890bdc9059

Open problems are also introduced, making this volume a must-read both for graduate students and active researchers in this field. They were written by mathematicians from several countries, including Brazil, Spain, Mexico, Japan and the USA, on relevant topics on Theory of Singularity, such as studies on deformations, Milnor fibration, foliations, Catastrophe theory, and myriad applications. This proceedings book brings selected works from two conferences, the 2nd Brazil-Mexico Meeting on Singularity and the 3rd Northeastern Brazilian Meeting on Singularities, that were hold in Salvador, in July 2015. All contributions were carefully peer-reviewed and revised, and cover topics like Equisingularity, Topology and Geometry of Singularities, Topological Classification of Singularities of Mappings, and more 890bdc9059

The articles in this volume are the outcome of the Impanga Conference on Algebraic Geometry in 2010 at the Banach Center in Bedlewo. The first four topics are represented by the notes from the mini courses held during the conference. The following spectrum of topics is covered: K3 surfaces and Enriques surfaces Prym varieties and their moduli invariants of singularities in birational geometry differential forms on singular spaces Minimal Model Program linear systems toric varieties Seshadri and packing constants equivariant cohomology Thom polynomials arithmetic questions The main purpose of the volume is to give comprehensive introductions to the above topics, starting from an elementary level and ending with a discussion of current research. Most of the material in this volume has not yet appeared in book form. This book is addressed to researchers and graduate students in algebraic geometry, singularity theory, and algebraic topology. In the articles, the reader will find classical results and methods, as well as modern ones 890bdc9059

Some of these complement topics previously explored in volumes I and II, such as, for instance, Zariski’s equisingularity, the interplay between isolated complex surface singularities and 3-manifold theory, stratified Morse theory, constructible sheaves, the topology of the non-critical levels of holomorphic functions, and intersection cohomology. This volume consists of ten chapters which provide an in-depth and reader-friendly survey of various important aspects of singularity theory. Other chapters bring in new subjects, such as the Thom–Mather theory for maps, characteristic classes for singular varieties, mixed Hodge structures, residues in complex analytic varieties, nearby and vanishing cycles, and more. Singularities are ubiquitous in mathematics and science in general. This is the third volume of the Handbook of Geometry and Topology of Singularities, a series which aims to provide an accessible account of the state of the art of the subject, its frontiers, and its interactions with other areas of research. The book is addressed to graduate students and

newcomers to the theory, as well as to specialists who can use it as a guidebook. Singularity theory interacts energetically with the rest of mathematics, acting as a crucible where different types of mathematical problems interact, surprising connections are born and simple questions lead to ideas which resonate in other parts of the subject, and in other subjects. Authored by world experts, the various contributions deal with both classical material and modern developments, covering a wide range of topics which are linked to each other in fundamental ways 890bdc9059