Differentiable Manifolds Forms Currents Harmonic Forms

Charge, Flux, and Metric
The Obstacle-Embracing Art of Abstract Gnomonics
Homogenization
Morse Theory for Hamiltonian Systems
The Laplacian on a Riemannian Manifold
(AMS-203)
From Differential Geometry to Non-commutative Geometry and Topology
Geometry and Theoretical Physics
From Particle Systems to Partial Differential Equations
Manifolds, Tensor Analysis, and Applications
Differential Manifolds. Forms, Currents, Harmonic Forms. Translated from the French by F.R. Smith. Introduction to the Englisc Edition by S.S. Chern
Microdifferential Systems in the Complex Domain
Eisenstein Cohomology for GLN and the Special Values of Rankin–Selberg L-Functions
Minimal Surfaces from a Complex Analytic Viewpoint
Complex Analysis and Dynamical Systems
Forms, Currents, Harmonic Forms
A Modern Perspective
Geometry and Topology of Submanifolds and Currents
Proceedings of the Conference Satellite to ICM 2006, Gebze Institute of Technology, Turkey, 8-14 September 2006
Complex Analysis and Potential Theory
Groups and Related Topics
Methods and Applications
St. Petersburg Mathematical Journal
Real and Complex Submanifolds
Proceedings of an International Conference on Complex Analysis and Dynamical Systems, June 19-22, 2001, ORT Braude College,

Karmiel, Israel
PSPDE IV, Braga, Portugal, December 2015
Advances in Noncommutative Geometry
On the Occasion of Alain Connes' 70th Birthday
On the Frontier of Probability and Dynamical Systems
Asymptotic Behaviour of Tame Harmonic Bundles and an Application to Pure Twistor D-Modules, Part 1
Handbook of Global Analysis
Geometric Models for Noncommutative Algebras
Proceedings of the First Max Born Symposium
Forms, Currents, Harmonic Forms
Differentiable Manifolds
Cartesian Currents
Mathematical Tools for the Study of the Incompressible Navier-Stokes Equations andRelated Models
Foundations of Classical Electrodynamics

ELAINA INGRID

Charge, Flux, and Metric Springer
This monograph offers the first systematic treatment of the theory of minimal surfaces in Euclidean spaces by complex analytic methods, many of which have been developed in recent decades as part of the theory of Oka manifolds (the h-principle in complex analysis). It places particular emphasis on the study of the global theory of minimal surfaces with a given complex structure. Advanced methods of holomorphic approximation, interpolation, and homotopy classification of manifold-valued maps, along with elements of convex integration theory, are implemented for the first time in the theory of minimal surfaces. The text also presents newly developed methods for constructing minimal surfaces in minimally convex domains of Rn, based on the Riemann–Hilbert boundary value problem adapted to minimal surfaces and holomorphic null curves. These methods also provide major advances in the classical Calabi–Yau problem, yielding in particular minimal surfaces with the conformal structure of any given bordered Riemann surface. Offering new directions in the field and several challenging open problems, the primary audience of the book are researchers (including postdocs and PhD students) in differential geometry and complex analysis. Although not primarily intended as a textbook, two introductory chapters surveying background material and the classical theory of minimal surfaces also make it suitable for preparing Masters or

PhD level courses.

The Obstacle-Embracing Art of Abstract Gnomonics Springer Nature

This book provides an introduction to the main geometric structures that are carried by compact surfaces, with an emphasis on the classical theory of Riemann surfaces. It first covers the prerequisites, including the basics of differential forms, the Poincaré Lemma, the Morse Lemma, the classification of compact connected oriented surfaces, Stokes' Theorem, fixed point theorems and rigidity theorems. There is also a novel presentation of planar hyperbolic geometry. Moving on to more advanced concepts, it covers topics such as Riemannian metrics, the isometric torsion-free connection on vector fields, the Ansatz of Koszul, the Gauss-Bonnet Theorem, and integrability. These concepts are then used for the study of Riemann surfaces. One of the focal points is the Uniformization Theorem for compact surfaces, an elementary proof of which is given via a property of the energy functional. Among numerous other results, there is also a proof of Chow's Theorem on compact holomorphic submanifolds in complex projective spaces. Based on lecture courses given by the author, the book will be accessible to undergraduates and graduates interested in the analytic theory of Riemann surfaces.

Homogenization American Mathematical Soc.

This book contains contributions from the participants of an international conference on complex analysis and dynamical systems. The papers collected here are devoted to various topics in complex analysis and dynamical systems, ranging from properties of holomorphic mappings to attractors in hyperbolic spaces. Overall, these selections provide an overview of activity in analysis at the outset of the twenty-first century. The book is suitable for graduate students and researchers in complex analysis and related problems of dynamics. With this volume, the Israel Mathematical Conference Proceedings are now published as a subseries of the ""AMS Contemporary Mathematics"" series.

Springer Science & Business Media

This monograph (in two volumes) deals with non scalar variational problems arising in geometry, as harmonic mappings between Riemannian manifolds and minimal graphs, and in physics, as stable equilibrium configuations in nonlinear elasticity or for liquid crystals. The presentation is selfcontained and accessible to non specialists. Topics are treated as far as possible in an elementary way, illustrating results with simple examples; in principle, chapters and even sections are readable independently of the general context, so that parts can be easily used for graduate courses. Open questions are often mentioned and the final section of each chapter discusses references to the literature and sometimes supplementary results. Finally, a detailed Table of Contents and an extensive Index are of help to consult this monograph

Morse Theory for Hamiltonian Systems Princeton University Press

In this work, I have attempted to give a coherent exposition of the theory of differential forms on a manifold and harmonic forms on a Riemannian space. The concept of a current, a notion so general that it includes as special cases both differential forms and chains, is the key to understanding how the homology properties of a manifold are immediately evident in the study of differential forms and of chains. The notion of distribution,

introduced by L. Schwartz, motivated the precise definition adopted here. In our terminology, distributions are currents of degree zero, and a current can be considered as a differential form for which the coefficients are distributions. The works of L. Schwartz, in particular his beautiful book on the Theory of Distributions, have been a very great asset in the elaboration of this work. The reader however will not need to be familiar with these. Leaving aside the applications of the theory, I have restricted myself to considering theorems which to me seem essential and I have tried to present simple and complete of these, accessible to each reader having a minimum of mathematical proofs background. Outside of topics contained in all degree programs, the knowledge of the most elementary notions of general topology and tensor calculus and also, for the final chapter, that of the Fredholm theorem, would in principle be adequate.

The Laplacian on a Riemannian Manifold Springer

This is a comprehensive exposition of topics covered by the American Mathematical Society’s classification “Global Analysis , dealing with modern developments in calculus expressed using abstract terminology. It will be invaluable for graduate students and researchers embarking on advanced studies in mathematics and mathematical physics. This book provides a comprehensive coverage of modern global analysis and geometrical mathematical physics, dealing with topics such as; structures on manifolds, pseudogroups, Lie groupoids, and global Finsler geometry; the topology of manifolds and differentiable mappings; differential equations (including ODEs, differential systems and distributions, and spectral theory); variational theory on manifolds, with applications to physics; function spaces on manifolds; jets, natural bundles and generalizations; and non-commutative geometry. - Comprehensive coverage of modern global analysis and geometrical mathematical physics - Written by world-experts in the field - Up-to-date contents

(AMS-203) Springer Science & Business Media

The author studies the asymptotic behaviour of tame harmonic bundles. First he proves a local freeness of the prolongment of deformed holomorphic bundle by an increasing order. Then he obtains the polarized mixed twistor structure from the data on the divisors. As one of the applications, he obtains the norm estimate of holomorphic or flat sections by weight filtrations of the monodromies. As another application, the author establishes the correspondence of semisimple regular holonomic D-modules and polarizable pure imaginary pure twistor D-modules through tame pure imaginary harmonic bundles, which is a conjecture of C. Sabbah. Then the regular holonomic version of M. Kashiwara's conjecture follows from the results of Sabbah and the author.

From Differential Geometry to Non-commutative Geometry and Topology Springer Science & Business Media

The words "microdifferential systems in the complex domain" refer to seve ral branches of mathematics: micro local analysis, linear partial differential equations, algebra, and complex analysis. The microlocal point of view first appeared in the study of propagation of singularities of differential equations, and is spreading now to other fields of mathematics such as algebraic geometry or algebraic topology. How ever it seems that many analysts neglect very elementary tools of algebra, which forces

them to confine themselves to the study of a single equation or particular square matrices, or to carryon heavy and non-intrinsic formula tions when studying more general systems. On the other hand, many alge braists ignore everything about partial differential equations, such as for example the "Cauchy problem", although it is a very natural and geometri cal setting of "inverse image". Our aim will be to present to the analyst the algebraic methods which naturally appear in such problems, and to make available to the algebraist some topics from the theory of partial differential equations stressing its geometrical aspects. Keeping this goal in mind, one can only remain at an elementary level.
Geometry and Theoretical Physics Springer Science & Business Media
The purpose of this book is to provide core material in nonlinear analysis for mathematicians, physicists, engineers, and mathematical biologists. The main goal is to provide a working knowledge of manifolds, dynamical systems, tensors, and differential forms. Some applications to Hamiltonian mechanics, fluid me chanics, electromagnetism, plasma dynamics and control thcory arc given in Chapter 8, using both invariant and index notation. The current edition of the book does not deal with Riemannian geometry in much detail, and it does not treat Lie groups, principal bundles, or Morse theory. Some of this is planned for a subsequent edition. Meanwhile, the authors will make available to interested readers supplementary chapters on Lie Groups and Differential Topology and invite comments on the book's contents and development. Throughout the text supplementary topics are given, marked with the symbols ~ and {l:;J. This device enables the reader to skip various topics without disturbing the main flow of the text. Some of these provide additional background material intended for completeness, to minimize the necessity of consulting too many outside references. We treat finite and infinite-dimensional manifolds simultaneously. This is partly for efficiency of exposition. Without advanced applications, using manifolds of mappings, the study of infinite-dimensional manifolds can be hard to motivate.
From Particle Systems to Partial Differential Equations Springer
he papers in this volume are mainly from the 2013 Midwest Geometry Conference, held October 19, 2013, at Oklahoma State University, Stillwater, OK, and partly from the 2012 Midwest Geometry Conference, held May 12-13, 2012, at the University of Oklahoma, Norman, OK. The papers cover recent results on geometry and topology of submanifolds. On the topology side, topics include Plateau problems, Voevodsky's motivic cohomology, Reidemeister zeta function and systolic inequality, and freedom in 2- and 3-dimensional manifolds. On the geometry side, the authors discuss classifying isoparametric hypersurfaces and review Hartogs triangle, finite volume flows, nonexistence of stable p-currents, and a generalized Bernstein type problem. The authors also show that the interaction between topology and geometry is a key to deeply understanding topological invariants and the geometric problems.
Manifolds, Tensor Analysis, and Applications Springer Nature
This text on analysis of Riemannian manifolds is aimed at students who have had a first course in differentiable manifolds.
Differential Manifolds. Forms, Currents, Harmonic Forms. Translated from the French by F.R. Smith. Introduction to the

Englisc Edition by S.S. Chern Springer Science & Business Media
In Natural Communication kritisiert der Autor das derzeitige Paradigma der Komplexitätswissenschaften, die Ziele immer spezifisch in den Blick nimmt. Er schlägt eine Alternative vor, die eine grundlegende Architektur der Kommunikation vorstellt. Sein Modell der „natürlichen Kommunikation" schließt moderne theoretische Konzepte aus Mathematik und Physik mit ein, insbesondere der Kategorietheorie und der Quantenmechanik. Er abstrahiert daraus präzise Grundbegriffe, die zu einer terminologischen Basis dieser Theorie führen und die Möglichkeit eröffnen, mit Komplexität neu umzugehen. Der Autor ist davon überzeugt, dass es nur durch einen Blick in die Vergangenheit möglich ist, eine Kontinuität und Kohärenz in unserer gegenwärtigen Denkweise herzustellen, insbesondere in Bezug auf die Komplexität.
Microdifferential Systems in the Complex Domain American Mathematical Soc.
Bringing together two fundamental texts from Frédéric Pham's research on singular integrals, the first part of this book focuses on topological and geometrical aspects while the second explains the analytic approach. Using notions developed by J. Leray in the calculus of residues in several variables and R. Thom's isotopy theorems, Frédéric Pham's foundational study of the singularities of integrals lies at the interface between analysis and algebraic geometry, culminating in the Picard-Lefschetz formulae. These mathematical structures, enriched by the work of Nilsson, are then approached using methods from the theory of differential equations and generalized from the point of view of hyperfunction theory and microlocal analysis. Providing a 'must-have' introduction to the singularities of integrals, a number of supplementary references also offer a convenient guide to the subjects covered. This book will appeal to both mathematicians and physicists with an interest in the area of singularities of integrals. Frédéric Pham, now retired, was Professor at the University of Nice. He has published several educational and research texts. His recent work concerns semi-classical analysis and resurgent functions.
Eisenstein Cohomology for GLN and the Special Values of Rankin–Selberg L-Functions Springer Science & Business Media
Differentiable ManifoldsForms, Currents, Harmonic FormsSpringer
Minimal Surfaces from a Complex Analytic Viewpoint Birkhäuser
A 1988 classic, covering Two-dimensional Surfaces; Domains on the Plane and on Surfaces; Brunn-Minkowski Inequality and Classical Isoperimetric Inequality; Isoperimetric Inequalities for Various Definitions of Area; and Inequalities Involving Mean Curvature.
Complex Analysis and Dynamical Systems Elsevier
"This book addresses mathematical problems motivated by various applications in physics, engineering, chemistry and biology. It gathers the lecture notes from the mini-course presented by Jean-Christophe Mourrat on the construction of the various stochastic "basic" terms involved in the formulation of the dynamic Ö4 theory in three space dimensions, as well as selected contributions presented at the fourth meeting on Particle Systems and PDEs, which was held at the University of Minho's Centre of Mathematics in December 2015. The purpose of the conference was to bring together prominent researchers

working in the fields of particle systems and partial differential equations, offering them a forum to present their recent results and discuss their topics of expertise. The meeting was also intended to present to a vast and varied public, including young researchers, the area of interacting particle systems, its underlying motivation, and its relation to partial differential equations. The book will be of great interest to probabilists, analysts, and all mathematicians whose work focuses on topics in mathematical physics, stochastic processes and differential equations in general, as well as physicists working in statistical mechanics and kinetic theory."

Forms, Currents, Harmonic Forms Springer Science & Business Media

"This monograph, which is intended for the Annals of Math Studies, presents an important new result that lies at the intersection of number theory, geometry, and representation theory. Accordingly, the book will serve as a key reference in these fields. Given its comprehensive methodological approach, the book will also provide a model for future work in these areas. This monograph builds on over forty years of ambitious research, initiated by Günter Harder in 1975. The results presented in this book extend well beyond previous research in the field, and are readily generalizeable"--

A Modern Perspective Springer Science & Business Media

In this book we display the fundamental structure underlying classical electro dynamics, i. e. , the phenomenological theory of electric and magnetic effects. The book can be used as a textbook for an advanced course in theoretical electrodynamics for physics and mathematics students and, perhaps, for some highly motivated electrical engineering students. We expect from our readers that they know elementary electrodynamics in the conventional (1 + 3)-dimensional form including Maxwell's equations. More over, they should be familiar with linear algebra and elementary analysis, in cluding vector analysis. Some knowledge of differential geometry would help. Our approach rests on the metric-free integral formulation of the conservation laws of electrodynamics in the tradition of F. Kottler (1922), E. Cartan (1923), and D. van Dantzig (1934), and we stress, in particular, the axiomatic point of view. In this manner we are led to an understanding of why the Maxwell equa tions have their specific form. We hope that our book can be seen in the classical tradition of the book by E. J. Post (1962) on the Formal Structure of Electro magnetics and of the chapter "Charge and Magnetic Flux" of the encyclopedia article on classical field theories by C. Truesdell and R. A. Toupin (1960), in cluding R. A. Toupin's Bressanone lectures (1965); for the exact references see the end of the introduction on page 11. .

Geometry and Topology of Submanifolds and Currents American Mathematical Soc.

This text was produced for the second part of a two-part sequence on advanced calculus, whose aim is to provide a firm logical foundation for analysis. The first part treats analysis in one variable, and the text at hand treats analysis in several variables. After a review of topics from one-variable analysis and linear algebra, the text treats in succession multivariable differential calculus, including systems of differential equations, and multivariable integral calculus. It builds on this to develop calculus on surfaces in Euclidean space and also on manifolds. It

introduces differential forms and establishes a general Stokes formula. It describes various applications of Stokes formula, from harmonic functions to degree theory. The text then studies the differential geometry of surfaces, including geodesics and curvature, and makes contact with degree theory, via the Gauss–Bonnet theorem. The text also takes up Fourier analysis, and bridges this with results on surfaces, via Fourier analysis on spheres and on compact matrix groups.

Proceedings of the Conference Satellite to ICM 2006, Gebze Institute of Technology, Turkey, 8-14 September 2006 American Mathematical Soc.

Edited in collaboration with the Grassmann Research Group, this book contains many important articles delivered at the ICM 2014 Satellite Conference and the 18th International Workshop on Real and Complex Submanifolds, which was held at the National Institute for Mathematical Sciences, Daejeon, Republic of Korea, August 10–12, 2014. The book covers various aspects of differential geometry focused on submanifolds, symmetric spaces, Riemannian and Lorentzian manifolds, and Kähler and Grassmann manifolds.