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Balkan Journal of Geometry and Its Applications 2004
Jordan Algebras Wilhelm Kaup 1994-01-01 The series is aimed specifically at publishing peer reviewed reviews and contributions presented at workshops and conferences. Each volume is associated with a particular conference, symposium or workshop. These events cover various topics within pure and applied mathematics and provide up-to-date coverage of new developments, methods and applications.
Algebraic Integrability, Painlevé Geometry and Lie Algebras Mark Adler 2004-09-01 This Ergebnisse volume is aimed at a wide readership of mathematicians and physicists, graduate students and professionals. The main thrust of the book is to show how algebraic geometry, Lie theory and Painlevé analysis can be used to explicitly solve integrable differential equations and construct the algebraic tori on which they linearize; at the same time, it is, for the student, a playing ground to applying algebraic geometry and Lie theory. The book is meant to be reasonably self-contained and presents numerous examples. The latter appear throughout the text to illustrate the ideas, and make up the core of the last part of the book. The first part of the book contains the basic tools from Lie groups, algebraic and differential geometry to understand the main topic.
The Prime Number Theorem G. J. O. Jameson 2003-04-17 At first glance the prime numbers appear to be distributed in a very irregular way amongst the integers, but it is possible to produce a simple formula that tells us (in an approximate but well defined sense) how many primes we can expect to find that are less than any integer we might choose. The prime number theorem tells us what this formula is and it is indisputably one of the great classical theorems of mathematics. This textbook gives an introduction to the prime number theorem suitable for advanced undergraduates and beginning graduate students. The author's aim is to show the reader how the tools of analysis can be used in number theory to attack a 'real' problem, and it is based on his own experiences of teaching this material.
American journal of mathematics 2004
Integrable Systems, Topology, and Physics Joel B Wolfe 2002 Ideas and techniques from the theory of integrable systems are playing an increasingly important role in geometry. Thanks to the development of tools from Lie theory, algebraic geometry, symplectic geometry, and topology, classical problems are investigated more systematically. New problems are also arising in mathematical physics. A major international conference was held at the University of Tokyo in July 2000. It brought together scientists in all of the areas influenced by integrable systems. This book is the second of three collections of expository and research articles. This volume focuses on topology and physics. The role of zero curvature equations outside of the traditional context of differential geometry has been recognized relatively recently, but it has been an extraordinarily productive one, and most of the articles in this volume make some reference to it.Symplectic geometry, Floer homology, twistor theory, quantum cohomology, and the structure of special equations of mathematical physics, such as the Toda field equations - all of these areas have gained from the integrable systems point of view and contributed to it. Many of the articles in this volume are written by prominent researchers and will serve as introductions to the topics. It is intended for graduate students and researchers interested in integrable systems and their relations to differential geometry, topology, algebraic geometry, and physics. The first volume from this conference, also available from the 'AMS', is ""Differential Geometry and Integrable Systems, Volume 308"" in the ""Contemporary Mathematics"" series. The forthcoming third volume will be published by the Mathematical Society of Japan and will be available outside of Japan from the 'AMS' in the ""Advanced Studies in Pure Mathematics"" series.
From Quantum Cohomology to Integrable Systems Martin A. Guest 2008-03-13 Quantum cohomology has its origins in symplectic geometry and algebraic geometry, but is deeply related to differential equations and integrable systems. This text explains what is behind the extraordinary success of quantum cohomology, leading to its connections with many existing areas of mathematics as well as its appearance in new areas such as mirror symmetry. Certain kinds of differential equations (or D-modules) provide the key links between quantum cohomology and traditional mathematics; these links are the main focus of the book, and quantum cohomology and other integrable PDEs such as the KdV equation and the harmonic map equation are discussed within this unified framework. Aimed at graduate students in mathematics who want to learn about quantum cohomology in a broad context, and theoretical physicists who are interested in the mathematical setting, the text assumes basic familiarity with differential equations and cohomology.
Analele ?tiin?ifice ale Universitatii "Al. I. Cuza" din Ia?i. Serie nou? Universitatea "Al. I. Cuza" din Ia?i 2002
Differential Geometry and Integrable Systems Martin A. Guest 2002 Ideas and techniques from the theory of integrable systems are playing an increasingly important role in geometry. Thanks to the development of tools from Lie theory, algebraic geometry, symplectic geometry, and topology, classical problems are investigated more systematically. New problems are also arising in mathematical physics. A major international conference was held at the University of Tokyo in July 2000. It brought together scientists in all of the areas influenced by integrable systems. This book is the first of three collections of expository and research articles. This volume focuses on differential geometry. It is remarkable that many classical objects in surface theory and submanifold theory are described as integrable systems. Having such a description generally reveals previously unnoticed symmetries and can lead to surprisingly explicit solutions.Surfaces of constant curvature in Euclidean space, harmonic maps from surfaces to symmetric spaces, and analogous structures on higher-dimensional manifolds are some of the examples that have broadened the horizons of differential geometry, bringing a rich supply of concrete examples into the theory of integrable systems. Many of the articles in this volume are written by prominent researchers and will serve as introductions to the topics. It is intended for graduate students and researchers interested in integrable systems and their relations to differential geometry, topology, algebraic geometry, and physics. The second volume from this conference, also available from the 'AMS', is ""Integrable Systems, Topology, and Physics, Volume 309"" in the ""Contemporary Mathematics"" series. The forthcoming third volume will be published by the Mathematical Society of Japan and will be available outside of Japan from the 'AMS' in the ""Advanced Studies in Pure Mathematics"" series.
Surveys on Geometry and Integrable Systems Martin A. Guest 2008 The articles in this volume provide a panoramic view of the role of geometry in integrable systems, firmly rooted in surface theory but currently branching out in all directions.The longer articles by Bobenko (the Bonnet problem), Dorfmeister (the generalized Weierstrass representation), Joyce (special Lagrangian 3-folds) and Terng (geometry of soliton equations) are substantial surveys of several aspects of the subject. The shorter ones indicate more briefly how the classical ideas have spread throughout differential geometry, symplectic geometry, algebraic geometry, and theoretical physics.Published by Mathematical Society of Japan and distributed by World Scientific Publishing Co. for all markets except North America
Minimal Surfaces: Integrable Systems and Visualisation Tim Hoffmann 2021-05-06 This book collects original peer-reviewed contributions to the conferences organised by the international research network “Minimal surfaces: Integrable Systems and Visualization” financed by the Leverhulme Trust. The conferences took place in Cork, Granada, Munich and Leicester between 2016 and 2019. Within the theme of the network, the presented articles

cover a broad range of topics and explore exciting links between problems related to the mean curvature of surfaces in homogeneous 3-manifolds, like minimal surfaces, CMC surfaces and mean curvature flows, integrable systems and visualisation. Combining research and overview articles by prominent international researchers, the book offers a valuable resource for both researchers and students who are interested in this research area.
Harmonic Morphisms, Harmonic Maps and Related Topics Christopher Kum Anand 1999-10-13 The subject of harmonic morphisms is relatively new but has attracted a huge worldwide following. Mathematicians, young researchers and distinguished experts came from all corners of the globe to the City of Brest - site of the first, international conference devoted to the fledgling but dynamic field of harmonic morphisms. Harmonic Morphisms, Harmonic Maps, and Related Topics reports the proceedings of that conference, forms the first work primarily devoted to harmonic morphisms, bringing together contributions from the founders of the subject, leading specialists, and experts in other related fields. Starting with "The Beginnings of Harmonic Morphisms," which provides the essential background, the first section includes papers on the stability of harmonic morphisms, global properties, harmonic polynomial morphisms, Bochner technique, f-structures, symplectic harmonic morphisms, and discrete harmonic morphisms. The second section addresses the wider domain of harmonic maps and contains some of the most recent results on harmonic maps and surfaces. The final section highlights the rapidly developing subject of constant mean curvature surfaces. Harmonic Morphisms, Harmonic Maps, and Related Topics offers a coherent, balanced account of this fast-growing subject that furnishes a vital reference for anyone working in the field.
Elliptic Integrable Systems Idrisse Khemar 2012 In this paper, the author studies all the elliptic integrable systems, in the sense of C, that is to say, the family of all the m-th elliptic integrable systems associated to a $k^\prime$-symmetric space $N=G/G_0$. The author describes the geometry behind this family of integrable systems for which we know how to construct (at least locally) all the solutions. The introduction gives an overview of all the main results, as well as some related subjects and works, and some additional motivations.
Harmonic Maps and Differential Geometry John C. Wood 2011 This volume contains the proceedings of a conference held in Cagliari, Italy, from September 7-10, 2009, to celebrate John C. Wood's 60th birthday. These papers reflect the many facets of the theory of harmonic maps and its links and connections with other topics in Differential and Riemannian Geometry. Two long reports, one on constant mean curvature surfaces by F. Pedit and the other on the construction of harmonic maps by J. C. Wood, open the proceedings. These are followed by a mix of surveys on Prof. Wood's area of expertise: Lagrangian surfaces, biharmonic maps, locally conformally Kahler manifolds and the DDVV conjecture, as well as several research papers on harmonic maps. Other research papers in the volume are devoted to Willmore surfaces, Goldstein-Pedrich flows, contact pairs, prescribed Ricci curvature, conformal fibrations, the Fadeev-Hopf model, the Compact Support Principle and the curvature of surfaces.
Bulletin of the American Mathematical Society 2003
Russian Mathematical Surveys 2006
JMSJ Nihon S?gakkai 2005
Bulletin (new Series) of the American Mathematical Society 2003
Encyclopedia of Nonlinear Science Alwyn Scott 2006-05-17 In 438 alphabetically-arranged essays, this work provides a useful overview of the core mathematical background for nonlinear science, as well as its applications to key problems in ecology and biological systems, chemical reaction-diffusion problems, geophysics, economics, electrical and mechanical oscillations in engineering systems, lasers and nonlinear optics, fluid mechanics and turbulence, and condensed matter physics, among others.
Developments of Harmonic Maps, Wave Maps and Yang-Mills Fields into Biharmonic Maps, Biwave Maps and Bi-Yang-Mills Fields Yuan-Jen Chiang 2013-06-18 Harmonic maps between Riemannian manifolds were first established by James Eells and Joseph H. Sampson in 1964. Wave maps are harmonic maps on Minkowski spaces and have been studied since the 1990s. Yang-Mills fields, the critical points of Yang-Mills functionals of connections whose curvature tensors are harmonic, were explored by a few physicists in the 1950s, and biharmonic maps (generalizing harmonic maps) were introduced by Guoying Jiang in 1986. The book presents an overview of the important developments made in these fields since they first came up. Furthermore, it introduces biwave maps (generalizing wave maps) which were first studied by the author in 2009, and bi-Yang-Mills fields (generalizing Yang-Mills fields) first investigated by Toshiyuki Ichiyama, Jun-Ichi Inoguchi and Hajime Urakawa in 2008. Other topics discussed are exponential harmonic maps, exponential wave maps and exponential Yang-Mills fields.
Integrable Systems, Loop Groups and Harmonic Maps Martin A. Guest 1995
Harmonic Maps, Loop Groups, and Integrable Systems Martin A. Guest 1997-01-13 University-level introduction that leads to topics of current research in the theory of harmonic maps.
Panamerican Mathematical Journal 2003
Integrable Systems N. J. Hitchin 2013-03-14 This textbook is designed to give graduate students an understanding of integrable systems via the study of Riemann surfaces, loop groups, and twistors. The book has its origins in a series of lecture courses given by the authors, all of whom are internationally known mathematicians and renowned expositors. It is written in an accessible and informal style, and fills a gap in the existing literature. The introduction by Nigel Hitchin addresses the meaning of integrability: how do we recognize an integrable system? His own contribution then develops connections with algebraic geometry, and includes an introduction to Riemann surfaces, sheaves, and line bundles. Graeme Segal takes the Kortewegde Vries and nonlinear Schrödinger equations as central examples, and explores the mathematical structures underlying the inverse scattering transform. He explains the roles of loop groups, the Grassmannian, and algebraic curves. In the final part of the book, Richard Ward explores the connection between integrability and the self-dual Yang-Mills equations, and describes the correspondence between solutions to integrable equations and holomorphic vector bundles over twistor space.
Harmonic Maps, Loop Groups, and Integrable Systems Martin A. Guest 1997-01-13 This is an accessible introduction to some of the fundamental connections among differential geometry, Lie groups, and integrable Hamiltonian systems. The text demonstrates how the theory of loop groups can be used to study harmonic maps. By concentrating on the main ideas and examples, the author leads up to topics of current research. The book is suitable for students who are beginning to study manifolds and Lie groups, and should be of interest both to mathematicians and to theoretical physicists as well.
Harmonic Maps and Integrable Systems John C. Wood 2013-07-02
Harmonic Maps, Conservation Laws and Moving Frames Helein 2002-06-13 Publisher Description
Mathematical Reviews 2007
Handbook of Global Analysis Demeter Krupka 2011-08-11 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
Geometry, Topology and Physics Boris N. Apanasov 1997-01-01 The series is aimed specifically at publishing peer reviewed reviews and contributions presented at workshops and conferences. Each volume is associated with a particular conference, symposium or workshop. These events cover various topics within pure and applied mathematics and provide up-to-date coverage of new developments, methods and applications.
Encyclopedia of Mathematical Physics Jean-Pierre Franc?(Boise 2006 The Encyclopedia of Mathematical Physics provides a complete resource for researchers, students and lecturers with an interest in mathematical physics. It enables readers to access basic information on topics peripheral to their own areas, to provide a repository of the core information in the area that can be used to refresh the researcher's own memory banks, and aid teachers in directing students to entries relevant to their course-work. The Encyclopedia does contain information that has been distilled, organised and presented as a complete reference tool to the user and a landmark to the

body of knowledge that has accumulated in this domain. It also is a stimulus for new researchers working in mathematical physics or in areas using the methods originating from work in mathematical physics by providing them with focused high quality background information. Editorial Board: Jean-Pierre Fran?oise, Universit? Pierre et Marie Curie, Paris, France Gregory L. Naber, Drexel University, Philadelphia, PA, USA Tsou Sheung Tsun, University of Oxford, UK Also available online via ScienceDirect (2006) - featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy.

Constant Mean Curvature Surfaces, Harmonic Maps and Integrable Systems Frederic Hélein 2012-12-06 This book intends to give an introduction to harmonic maps between a surface and a symmetric manifold and constant mean curvature surfaces as completely integrable systems. The presentation is accessible to undergraduate and graduate students in mathematics but will also be useful to researchers. It is among the first textbooks about integrable systems, their interplay with harmonic maps and the use of loop groups, and it presents the theory, for the first time, from the point of view of a differential geometer. The most important results are exposed with complete proofs (except for the last two chapters, which require a minimal knowledge from the reader). Some proofs have been completely rewritten with the objective, in particular, to clarify the relation between finite mean curvature tori, Wente tori and the loop group approach - an aspect largely neglected in the literature. The book helps the reader to access the ideas of the theory and to acquire a unified perspective of the subject.

Elliptic Integrable Systems Idrisse Khemar 2012 Then we can integrate it in the corresponding loop group and finally apply some factorization theorems in loop groups to obtain a generalised Weierstrass representation: this is the DPW method. Moreover, these methods of integrable system theory hold for all the systems written in the forms of a zero curvature equation for some ??=??m? ?m+?+? 0+?+?m? m. Namely, these methods apply to construct the solutions of all the m m-th elliptic integrable systems. So it is natural to ask what is the geometric interpretation of these systems. Do they correspond to some generalisations of harmonic maps? This is the problem that we solve in this paper: to describe the geometry behind this family of integrable systems for which we know how to construct (at least locally) all the solutions. The introduction below gives an overview of all the main results, as well as some related subjects and works, and some additional motivations.

Geometry Of Biharmonic Mappings: Differential Geometry Of Variational Methods Hajime Urakawa 2018-12-06 'The present volume, written in a clear and precise style, ends with a rich bibliography of 167 items, including some classical books and papers. In the reviewer’s opinion, this excellent monograph will be a basic reference for graduate students and researchers working in the field of differential geometry of variational methods.'zbMATHThe author describes harmonic maps which are critical points of the energy functional, and biharmonic maps which are critical points of the bienergy functional. Also given are fundamental materials of the variational methods in differential geometry, and also fundamental materials of differential geometry.

Partial Differential Equations and Applications Xue Ping Wang 2007 This volume contains expanded versions of lecture notes of CIMPA's school held in Lanzhou in July 2004. These texts offer a detailed survey, including the most recent advances, of some topics in analysis of partial differential equations arising from physics, mechanics and geometry such as Korteweg-de Vries equation, harmonic maps, Birkhoff normal form and KAM theorem for infinite dimensional dynamical systems, vorticity of Euler equation, semi-classical analysis of Schrodinger and Dirac equations, and limiting situations of semilinear elliptic equations. They are mainly aimed at students and young researchers interested in these subjects.

Encyclopaedia of Mathematics Michiel Hazewinkel 2012-12-06 This is the second supplementary volume to Kluwer's highly acclaimed eleven-volume Encyclopaedia of Mathematics. This additional volume contains nearly 500 new entries written by experts and covers developments and topics not included in the previous volumes. These entries are arranged alphabetically throughout and a detailed index is included. This supplementary volume enhances the existing eleven volumes, and together these twelve volumes represent the most authoritative, comprehensive and up-to-date Encyclopaedia of Mathematics available.

Calabi-Yau Varieties: Arithmetic, Geometry and Physics Radu Laza 2015-08-27 This volume presents a lively introduction to the rapidly developing and vast research areas surrounding Calabi–Yau varieties and string theory. 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 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.” 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.

Harmonic Maps and Integrable Systems Allan P. Fordy 1994 This book brings together experts in the field to explain the ideas involved in the application of the theory of integrable systems to finding harmonic maps and related geometric objects. It had its genesis in a conference with the same title organised by the editors and held at Leeds in May 1992. However, it is not a conference proceedings, but rather a sequence of invited expositions by experts in the field which, we hope, together form a coherent account of the theory. The editors have added cross-references between articles and have written introductory articles in an effort to make the book self-contained. There are articles giving the points of view of both geometry and mathematical physics. Leeds, England A. P. Fordy October 1993 J. e. Wood Authors' addresses J. Bolton, Dept. of Math. Sciences, Univ. of Durham, South Road, Durham, DHI 3LE, UK A. I. Bobenko, FB Math. , Tecbnische Univ. , Strasse des 17. Juni. 135, 10623 Berlin, Germany M. Bordemann, Falc. fUr Physik, Albert-Ludwigs'Univ. , H. -Herder-Str. 3, 79104 Freiburg, Germany F. E. Burstall, Dept. of Mathematics, Univ. of Bath, Claverton Down, Bath, BA 7 7 AY, UK A. P. Fordy, School of Mathematics, Univ. of Leeds, Leeds, LS2 9JT, UK M. Forger, Falc. fUr Physik, Albert-Ludwigs Univ. , H. -Herder-Str. 3, 79104 Freiburg, Germany M. A. Guest, Dept. of Mathematics, Univ. of Rochester, Rochester, NY 14627, USA P. Z. Kobalc, Math. Institute, Univ. of Oxford, 24-29 St.

Darboux Transformations in Integrable Systems Chaohao Gu 2006-07-09 The Darboux transformation approach is one of the most effective methods for constructing explicit solutions of partial differential equations which are called integrable systems and play important roles in mechanics, physics and differential geometry. This book presents the Darboux transformations in matrix form and provides purely algebraic algorithms for constructing the explicit solutions. A basis for using symbolic computations to obtain the explicit exact solutions for many integrable systems is established. Moreover, the behavior of simple and multi-solutions, even in multi-dimensional cases, can be elucidated clearly. The method covers a series of important equations such as various kinds of AKNS systems in R1+n, harmonic maps from 2-dimensional manifolds, self-dual Yang-Mills fields and the generalizations to higher dimensional case, theory of line congruences in three dimensions or higher dimensional space etc. All these cases are explained in detail. This book contains many results that were obtained by the authors in the past few years. Audience: The book has been written for specialists, teachers and graduate students (or undergraduate students of higher grade) in mathematics and physics.

Selected Papers on Harmonic Analysis, Groups, and Invariants Katsumi Nomizu 1997 The five papers originally appeared in Japanese in the journal Sugaku and would ordinarily appear in the Society's translation of that journal, but are published separately here to expedite their dissemination. They explore such aspects as representation theory, differential geometry, invariant theory, and complex analysis. No index. Member prices are $47 for institutions and $35 for individual. Annotation copyrighted by Book News, Inc., Portland, OR.